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Volume 21 March, 1956 Number 1

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The American Speech and Hearing Association

THIRTY-SECOND ANNUAL CONVENTION

November 19-21, 1956, Palmer House Hotel, Chicago

FORMAL CALL FOR PAPERS

This invitation is being issued to all members of the Association to submit abstracts of papers which they wish to have considered for presentation on the program at the Annual Convention in 1956. All proposals must be in the form of an abstract; titles alone cannot be considered. Members who do not have a paper to give, but who wish to make program suggestions, are strongly urged to forward these to the Program Committee. Abstracts or program suggestions should be sent to Jack Matthews, Speech Department, University of Pittsburgh, Pittsburgh, Pennsylvania. Non-members may submit abstracts, but these must be sponsored by a member.

Abstracts will be accepted until *May 15*, but members are urged to forward their proposals as far in advance of that date as possible. Program suggestions must be sent in at once if they are to receive adequate consideration.

The abstract should indicate (1) the full title of the paper, (2) the name of the contributor and his professional affiliation, (3) a summary of the content of the paper, (4) the time required for presentation, and (5) details of any equipment needed for presentation. It is recommended that papers be planned so that no more than 12 minutes will be required for their presentation. Longer papers will be considered, but can be accepted only if they are of unusual interest or significance.

Papers are invited on all aspects of the speech and hearing processes and human communication. They may deal with *fundamental theoretical work* in these fields, report *experimental or clinical studies* of the speech and hearing processes and their disorders, describe *practical techniques in speech and hearing diagnosis and therapy* or be concerned *with professional problems and procedures.*

The committee hopes to make a place on the program for a large majority of the submitted papers. We wish to emphasize that the submission of worth-while papers is not only a privilege but a professional obligation of members of the Association. The quality of the program will depend primarily upon the kind and number of papers offered for the consideration of the program committee.

Submission of an abstract implies that the contributor accepts the following responsibilities: (1) He must be present in person at the scheduled time. If unforseen circumstances prevent his attendance, he must notify the chairman of his section meeting as far in advance as possible. (2) He must keep strictly within the time limits indicated on the printed program, and should assure himself *in advance* that this can be done. (3) He must make

certain that his material is organized in a manner suitable for *oral* presentation. (4) He must be sure that all visual aids (slides, films, and the like) are of such a nature that they are adequate for the conditions which typically exist in the rooms in which section meetings are held.

It is the hope of the committee that the 1956 convention program will be of high quality and sufficiently varied to meet the wishes of the various special interest groups who make up the Association. Your cooperation is needed in meeting these objectives.

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Professional Training In Speech Correction And Clinical Audiology

H. Harlan Bloomer

Most of us recognize the diversity of background and interest which characterizes our membership. I shall not attempt, therefore, to bring a message of equal interest to everyone, for I wish to discuss the problems of that segment of our profession which represents the clinical fields of speech correction and audiology. I propose to deal specifically with professional training in these areas.

There are several aspects of our work in professional training which urgently need attention. The recruitment of more clinicians is a pressing problem and there is the need to expand and improve the facilities of our training institutions in accord with the forecast increases in college enrollments. We need above all, I believe, to re-evaluate and re-define standards of professional training, in order that we may better serve students and clients.

The college and university student entering the profession has a right to expect training which will develop his clinical competency and at the same time provide a basis for his continuing education and intellectual growth. The college and university teacher who trains him, on the other hand, deserves to know that his efforts go to the building of a mind and a character worth the toil and sacrifice that he makes; for the training of students requires both sacrifice and toil, and deserves the reward of a good student. Both teacher and student have the right to expect that their professional organization, The American Speech and Hearing Association, shall encourage by every possible means the development of strong professional educational programs, the selection of capable students, and the continuing intellectual stimulation of its membership.

Your Association has not dodged its responsibilities in any of these matters. Training standards have been established. We maintain a professional journal of excellent quality. We have committees of our members which undertake constant surveillance of professional problems. Yet with all of this I think few of us would say that programs of professional education have reached the point that we can be satisfied with them.

The White House Conference Committee under chairmanship of Wendell Johnson called attention in its 1952 report to a need for 15,000 speech therapists if complete coverage is to be provided for all of the patients needing help. At the present time, we are training far less than the number needed to fill even the present positions available. Furthermore,

H. Harlan Bloomer (Ph.D., University of Michigan, 1935) is Professor of Speech and Director of the Speech Clinic, University of Michigan. This article is an adaption of the Presidential Address delivered at the ASHA convention in Los Angeles on November 17, 1955.

the job turnover is considerable, necessitating that a large number of new graduates each year go into employee replacements.

We need more than numbers of workers, however. We need prospective students and professional workers of high quality, capable of performing the exacting tasks of clinical work in a highly challenging field of human welfare. The satisfaction of this need will require an organized recruitment program. It is imperative that recruitment plans include procedures for selecting students with the intellectual capacity, the emotional stability, and the personal motivation to succeed in clinical work.

The lack of standardization or uniformity in course content in the basic subject matter areas of speech correction and audiology is one of our perennial difficulties. Members of the Clinical Certification Committee have repeatedly emphasized the problems they face in avaluating the equivalence of courses offered by training centers. Those of you who at your own institutions have struggled to advise a student who has transferred from another school are well aware of the difficulty in deciding his present level of knowledge and clinical experience. His transcript is likely to be of slight assistance in this regard, because course titles tell so very little about the course content. A search of catalogs and a few encounters of course listings such as 'Speech Therapy I' and 'Speech Therapy II' are likely to leave an advisor not only in confusion but in a state of profound depression from which even Semantics I, II, and III may not be able to rescue him!

Our present clinical standards define in only the most general terms the minimum course requirements in basic, specialized, and cognate areas. The end result of the latitude thus allowed to training institutions is the continuation of a considerable diversity in course content under the cloak of similar or identical course titles.

A problem similar in nature to this is raised by the generality of the requirements of clinical experience. The certification requirements specify the amount of time that a student or a professional worker must devote to the gathering of clinical experience, but they are understandably vague about the nature of that experience. A realistic appraisal of the matter indicates that at present every training center faces almost insurmountable odds in providing a suitable variety of clinical cases for its students. Each student presumably should have supervised clinical experience with cases representing a desirable distribution of symptom types at each significant age level and over a period of time sufficient to benefit both student and patient. We have no real way, however, of assuring ourselves at present that members have received a proper generality or depth of clinical experience when they are admitted to clinical standing in the Association.

In reviewing these problems, it became apparent to me that not only are our training standards vague but we have never really come to grips with the problem of defining the nature of clinical work. Before long we shall have to decide just what the professional fields of clinical speech and audiology are. Perhaps this statement seems a bit naive, but do we really know our rightful boundaries? What

terms describe us: Teachers? Clinicians? Therapists? Technicians? Counselors? It was surprising to me to realize that aside from an occasional brief discussion in textbooks, our literature contains little which defines explicitly the scope of our profession.

It may be that in the formative years of the Association we have benefited rather than suffered by this apparent neglect of definition. Our field is a relatively young one. A mere thirty years have passed since the founding of the American Academy of Speech Correction from which we are descended. Our membership has long included representatives from many different disciplines. It is fortunate, indeed, if the varied interests of our members have helped us to avoid the establishment of narrow and restrictive confinements to professional growth. But on the other hand there is grave danger in an amorphous, unstructured diversity of concepts as to what we are and what constitutes the scope of our clinical responsibilities. If we define our work too narrowly, we are likely to become little more than technicians. If, however, we establish broad boundaries we must educate and discipline ourselves for a ready acceptance of the heavy responsibility for human welfare which such boundaries imply.

In 1952, Spencer Brown stimulated a good deal of comment *pro* and *con* about the job of the speech clinician. The interest which this editorial stirred seems to me to have had value far outweighing the possible detriment from internicine battles it may have started. His challenging editorial and the replies to his challenge were both thoughtful and thought provoking.

Are we in truth primarily teachers, as many of you asserted in your replies? If so, does this suggest the abandonment of the vast score of clinical procedures which are well outside the field of teaching as traditionally defined? Does a concept of ourselves as teachers imply a restricted function that effectively denies the need for all but a limited sort of professional exploration into the nature of the disorders which we seek to alleviate?

If the term 'teacher' describes us accurately, should we then assume that we are legitimately a part of the broad field of 'special education' with its rather consistent implications of responsibility for the academic education of the handicapped child? Responsibility of this sort has never been traditionally a part of our field and yet we find ourselves oftentimes grouped administratively and professionally with areas of Special Education.

Another group of members has maintained that professionally we are a 'branch of clinical psychology'. Occasionally people with this training and only a modicum of information about speech gain employment as speech therapists. Is this desirable? Can one learn enough about speech through training in clinical psychology to qualify one ethically and practically to work with the speech and hearing problems of patients who have cleft palate, voice disorders, severe hearing loss, etc? There is a vast store of information peculiar to the field of clinical psychology. There is a similarly vast amount of information peculiar to the fields of clinical speech and audiology. Is it really possible for the average professional individual to be qualified in more than

one of these two fields except in some very restricted areas of clinical competence? If it is possible to be prepared in both, are we really ready to demand for our students the rigorous training program which any sensible combination of the two fields would require? If not, can we justifiably call speech pathology or clinical audiology branches of clinical psychology?

If we belong among the 'healing arts', as has been suggested, we must ask ourselves whether we are ready to accept the requirement of training in the basic sciences which is demanded of practitioners of the 'healing arts' in most states. We must ask ourselves also if we are able to accept the legal responsibilities which this membership implies.

There are those who would claim that our work places us in parallel with or perhaps as a part of the quasi-medical fields. If so, are we to consider ourselves assistants to the medical field in a sense similar to that of the physiotherapist, the medical social worker, or the occupational therapist? Such a concept would place us essentially as technical assistants to the various fields of medicine.

If such is truly our status, with what medical specialists should we train our students to work? Are we most closely related to otolaryngology, pediatrics, internal medicine, orthopedics, physical medicine, neurology, psychiatry, or allergy? Are we more properly related to the specialities of oral surgery, plastic surgery, orthodontics, or dental prosthetics? Our professional work touches all of these specialties and perhaps others at some points.

Is our work within the scope of the Public Health field with its strong emphasis on disease prevention and social responsibilities for health? Some members of our profession have found their employment within the field of Public Health.

There is no quick and categorical answer to these questions. We can find aspects of our work which would seem to place us close to all of the fields mentioned above. Such diversity of association has elements of tremendous vitality in it. But it also contains elements of conflict which may lead to confusion unless we succeed in defining the unique character of our work.

As you may have observed, while we have temporized in defining our field, other professions and other agencies have cast us in roles from which we may have difficulty in withdrawing, if at some time this seems desirable. Various federal agencies have proceeded as if they know just what our profession is and what our members are capable of doing. In general, these agencies have not proceeded as if we were a unique field but as if we were a profession which has achieved its academic and clinical respectability through training in other clinical or educational disciplines. If they are right in so treating us, we have lost precious ground which we shall have to regain if we are to establish our rightful professional destiny.

I suggest an operational approach to the problems of defining our field and improving our training programs. I suggest that we consider first of all the functions we perform as speech pathologists and therapists and as clinical audiologists and that we define our work and organize our training programs accordingly. It seems to me that our clinical operations in-

clude (1) examination of the patient, (2) therapy through teaching, (3) counseling with the patient or his family, and (4) consultation with other specialists or agents concerned with the patient's welfare. I wish to review each of these operations briefly, and to suggest that professional training should stress the functions of examination, counselling, and consultation far more than is generally done now.

Too often we behave as if the job of the *examiner* were merely to identify and classify symptoms of various disorders of speech or hearing. He must, of course, do far more than this. He must be prepared not only to distinguish the nature of the speech and hearing symptoms, but he must see them and their etiological factors in relationship to a living organism existing in a complex society. In addition to an evaluation of the status of the patient at the initial examination, the examiner needs adequate procedures for evaluating his progress under therapy. To do these things, he must measure physical, psychological, and environmental factors as they relate to speech—a task which conceivably requires the knowledge and professional skill of a person trained as a physician, a psychologist, and a social worker as well as having training in the nature of speech and hearing disorders. Obviously, this calls for considerable wisdom and diagnostic skill which few of us would claim to have in sufficient measure. If we admit the obvious need to depend on other specialists to supply certain clinical data to us, we gain much, but we also impose upon ourselves and upon the team members who work with us certain obligations for skillful interaction. Yet, skillful interaction often demands years of painstaking effort to achieve. The 'team' approach is fine but the 'team' must be composed of more than a collection of specialists with tunnel vision.

Whatever the nature of our employment, whether in public school programs, university clinics, hospital or private practice, our skill as examiners is likely to be one of the real determinants of our success in treatment.

Our teaching function is not one of the topics on which I need to say much. The art of *teaching* a person handicapped in speech or hearing is clearly and traditionally part of our field. Nevertheless, we need to scrutinize and criticize the methods of training students in the art of teaching.

What kinds of courses and what kinds of clinical experiences are required to develop skill in the selection and combination of the proper direct and indirect approaches to teaching? What knowledge of child growth and development, personality structure and theories of learning, are needed to supplement special teaching procedures in the speech and hearing areas?

A few trail-blazing efforts have been made in the attempt to improve the level of our teacher training function, but it seems obvious that even in this area in which so much time and effort have been spent there is need for continued thought and a good bit of careful research.

The speech and hearing clinician rarely finds himself in a professional relationship with a patient—child or adult—in which he is not called upon to *counsel* as well as to teach and examine. It is not necessary to invoke

the term 'psychotherapy' here, but rather to refer to some of the plain facts of human relationships.

For example, the findings of a clinical examination must be presented to the patient or to his parents. Mere presentation is hardly enough, however, for if the findings of the examination are to be useful to the patient, they must be presented in a way that he can understand and accept and which are in accord with the realities of his life. How often have we told a patient what is 'for his good' only to find out later that none of it has been accepted? How often have we found a stutterer who can talk without stuttering, but doesn't? Or a hard-of-hearing person who can benefit from his hearing aid or from lip reading, but uses neither of them effectively?

In many instances, failures with these patients have come about because we failed our role as counselor. Assuredly, psychotherapy in any strict sense of the term is not a part of our job, but we need to train students to handle dynamic human relationships without failing their task or overstepping the functions for which they are trained. If such training is to be provided, special emphasis on it will have to be included in our courses and supervised clinical practice.

It has been emphasized repeatedly that speech and hearing problems often arise from conditions whose correction requires the services of many specialists. It is by consultation that these services are best performed and the work of the various specialists is integrated. Such integration of function calls for a delicate co-ordination in which each specialist correctly conceives of his role in relation to the others.

What are we doing in our professional training programs which teaches students to work effectively with other specialists? Perhaps we accomplish this at the most advanced level of training, but it seems evident that we need to incorporate some aspect of this training at all levels of professional education.

In addition to training toward these general functions of the speech and hearing specialist, perhaps we should also consider that to some extent training should be specific according to our intended employment and the professional associates with whom we expect to work. It should be possible for us to define, to a greater extent than we do now, the nature of training objectives in terms of the occupational placement of professional workers. We should recognize that some will work in public schools, some will work in hospitals, some in college and university clinics, some in Public Health agencies, and that others will work in private practice. Thus far we have achieved occupational training mainly for the person who will work in the public school or the college and university clinic. Should we not extend the concept to include our other occupational specialties?

In summary, I have called attention to certain needs which I regard as essential to the re-examination of our professional training in clinical speech and hearing. These have included: (1) The need for selective recruitment of students; (2) The need for specification of course content and equivalence of course titles in the various training institutions; (3) The need to provide and require breadth and depth

of clinical experience; and (4) The need to define the nature and scope of clinical fields and to design professional training programs according to the four major functions which I believe to characterize our work: (a) examination, (b) teaching, (c) counseling, and (d) consultation.

The task of dealing with the problems which I have presented is one of considerable magnitude requiring a good deal of time and effort on the part of dedicated groups of people if we are to find satisfactory solutions to these problems. It is entirely possible that we can find solutions if we can provide funds to support a committee which will undertake an active and concentrated study of these problems. This will take both time and money. I believe that such funds can be obtained through application to a philanthropic foundation or some government agency interested in the training of professional people. If not, the problems are of sufficient gravity to warrant the allocations of funds from our own treasury for this purpose.

In reviewing critically the nature and objectives of our training programs and in referring to the seeming lack of clear definition of the scope of our work, I do not wish to minimize the progress we have made in the past thirty years of our growth. Much solid work has been done, but an even greater burden of work and planning lies ahead. It is up to the members of the American Speech and Hearing Association to create and become the articulate spokesmen for a spirit of urgency about the need to review training objectives and to define the educational procedures for achieving them.

Adjustment Problems Of The Cerebral Palsied

Wendell Johnson

One of the more practical and positive ways to approach the adjustment problems of the cerebral palsied is to consider certain kinds of improvement to be included among the important objectives of their training and education. These kinds of improvement have to do with the cerebral palsied individual's self-feelings and his relationships with other persons. They are kinds of improvement that can be furthered in varying degrees by good physiotherapy, occupational therapy, and speech therapy, by well planned education, by favorable family situations, and by sound community and large-scale social policies and atmospheres. So far as they are not brought about by these means, special measures are called for. These include psychotherapy, in cases requiring it, or something in the same general spirit but less formal or profound in cases that do not appear to warrant systematic psychiatric attention.

Speaking broadly, it might reasonably be assumed that therapy programs would be improved, so far as the psychological welfare of the person who has cerebral palsy is concerned, if sustained and serious attention were given to three particular matters. The first has to do with the team approach. There is a danger in having the physiotherapist working with the child's muscles, the speech therapist with his speech, the occupational therapist with certain of his constructive activities, the teacher with school subjects and skills he is to learn, the orthopedic surgeon with his joints, the neurologist with his reflexes, and the pediatrician with his metabolism—there is a danger that nobody will notice the child. This, of course, over-simplifies the situation, but it does point up a problem that can be grave in many instances.

In general, there are probably two broad solutions to this problem. One is to add another member to the team: a psychologist, or a psychiatrist, or in some cases a person designated more ambiguously as a psychotherapist. The other solution lies in making every member of the team more conscious of the psychological aspects of cerebral palsy and more capable of reacting to them effectively. Doubtless a combination of these two solutions is the best approach in most situations. In the present discussion, however, the main emphasis will be placed on trying to bring about a better understanding on the part of everyone concerned of the person who has the cerebral palsy.

In work with the cerebral palsied, more thought is given to the problem

Wendell Johnson (Ph.D., State University of Iowa, 1931) is Professor of Speech Pathology and Psychology, University of Iowa. This article is a condensation of a lecture delivered at Brooklyn College in the Third Professional Cerebral Palsy Institute, sponsored by the Coordinating Council for Cerebral Palsy in New York City, Inc., in cooperation with the Speech and Hearing Clinic of Brooklyn College.

as it affects children rather than adults. This is the second matter requiring attention in order to make therapy programs more effective from a broadly human point of view. If it is true that the child is father to the man, much more attention must be paid to the kind of man the child is 'fathering.' More investigation is required of the needs and problems of the *adult* cerebral palsied. This is needed in order to see more clearly just what the objectives should be in the personality and character training of cerebral palsied children. There is at present a possibility that cerebral palsied children tend to be treated *as children* far beyond the age levels at which they might better be dealt with as adults. If this is true, a major reason for it could be that no one has a very clear idea of the kinds of adults most cerebral palsied children could or should become.

The third matter which needs increased attention—and it is one which comes into focus more sharply in concentrating on the individual person who has cerebral palsy—is the problem of defining the patient. It is by no means obvious as a rule just who the patient might be. A little pondering of this very basic question certainly makes one thing quite plain: the patient is never just one person. An individual with cerebral palsy does not exist in a social, economic, and cultural vacuum. He is, rather, the hub of a more or less complex situation in which a number of other persons are also involved. It is a peculiarly practical statement in many cases that the family is the patient. It is advisable, that is, to design the training and therapy in any instance in such a way that it will affect all the persons who are importantly related to the situation in which the cerebral palsy exists. The members of the family and other persons important to the cerebral palsied individual play a tremendous role in determining his motivations, values, moods, interests, standards, attitudes, strivings and activities. These other persons, then, must be 'in on' any campaign designed to change the cerebral palsied individual's personality if it is to be effective.

Moreover, the family is the patient in another sense. It is the patient in the very direct sense that, individually and collectively, the members of the family are themselves affected by the immediate presence of cerebral palsy and of the cerebral palsied family member. Their lives, particularly the lives of the mother and father, are different because there is cerebral palsy in the family. This fact is important in its own right and calls for appropriate therapeutic attention, if not from the physiotherapist or pediatrician or speech therapist or orthopedic surgeon, then from someone else. Is this someone else to be a psychologist, a psychiatrist, a social worker? Or, might it be any single member of the team who happens to be prepared to do what needs doing?

Another possibility, of course, is that there be created a new kind of professional worker, a sort of quarterback for the cerebral palsy team. This new kind of worker would be qualified to work not only with the whole person—which would be more remarkable than is usually assumed—but even with the whole patient and the whole problem. Until this paragon is actually created, however, it would seem desirable and even quite practical for each and every member of the whole team to appreciate so far as possible

the whole person, the whole patient, and the whole problem.

As was said at the beginning of this paper, one of the more direct and positive ways to gain this kind of comprehensive grasp of the cerebral palsied person's problem *as a person* is to become familiar with those kinds of improvement that have the effect of moving the cerebral palsied individual toward greater and greater self-sufficiency and social effectiveness.

One of the most basic of these kinds of improvement would appear to be concerned with verbal output—the cerebral palsied person's speaking time. Just the sheer speaking time itself is important, and much more information is needed about the amount of talking done by cerebral palsied children and adults. In the absence of adequate norms, preliminary observations made by the writer and his students would seem to indicate that the average normally speaking college student talks somewhere between a half-hour and an an hour a day. (This means solid speaking time, not total time spent in conversation or in situations involving speaking. In an hour's conversation, a person may actually speak only five minutes or even less.)

It is to be expected that, other things equal, and allowing for understandable exceptions, as a cerebral palsied child grows up socially and as a personality, he will increase his speaking time. He will respond speech-wise to more and more persons and in more and more situations. Research is needed that will determine the normal range and the general average of verbal output for cerebral palsied individuals of different age levels and with varying types and severity of cerebral palsy. Investigation is needed that will tell us much more about the factors or conditions that make for greater and lesser amounts of talking by the cerebral palsied. Research is needed on the effects of varying amounts of talking —effects on learning, on moods, on development of interests and enthusiasms, on attitudes toward self and others, and on the improvement of speech itself. And information is needed on how increased speaking is related to other kinds of change and improvement.

Moreover, there are different kinds of speaking. It differs with respect to what is talked about, the mood it expresses, and form or style. There is need for study of such differences in speech and the differences they make so far as personal and social development are concerned.

In the meantime, it is probably sound to assume that cerebral palsied children and adults stand to gain not only from speech therapy in the ordinary sense, but also from the general expansion and enrichment of speech behavior.

Among the many other dimensions of improvement that are important in relation to the cerebral palsied individual's personal growth and development are three that have to do with attitudes. First, improvement in the attitude toward the cerebral palsy itself consists importantly in the development of greater and greater objectivity. This takes such forms as decreased self-pity, a falling away of feelings of apology and shame, and an increased interest in cerebral palsy as a condition to be studied, observed, experimented with, understood theoretically and practically, and modified advantageously so far as possible, but lived with gracefully in the meantime.

Objectivity is also to be seen in the individual's demonstrated ability to discuss in a matter-of-fact way and in a problem-solving spirit the cerebral palsy and the problems associated with it.

Second, improvement in the attitude toward self is to be seen particularly in an increase in self-acceptance. By this is meant not apathy or resignation, not acceptance in the sense of giving up hope of improving. What is meant is self-acceptance as contrasted with self-rejection—the acceptance of oneself as a person worth being and worth knowing, a person with real possibilities for enjoyment, growth, learning, and achievement.

Third, improvement in attitude toward others is to be observed in the cerebral palsied individual's tendency to like others more, to be more positive, more responsive toward others, and to spend more time with others, particularly in useful and enjoyable activities.

Another significant dimension of improvement concerns the ability to adapt to new situations, and still another closely related to this one has to do with the ability to recover from slumps. The cerebral palsied child or adult who can make himself at home readily in new situations is one who is not unduly dependent for his sense of security on familiar persons and surroundings. Training in what might be called considerate independence is essential if the child is to be father to a man who can afford psychologically to be reasonably adventurous. The range of any person's opportunities for enjoyment and achievement is largely determined by his ability to 'snap out of' blue moods and bad days and his capacity for undertaking new experiences and fitting into new circumstances and surroundings.

This suggests another very important kind of improvement, that which has to do with social adjustment in direct and specific ways. Major aspects of social adjustment in this connection are group memberships, school activities, social activities, sharing of hobbies, number of acquaintances, and 'closeness' of friends. With regard to friendships, it is not so much a matter of the number—in fact, it hardly seems possible to have more than a few good time-spending friends—as it is of their nature. What is important is that the relationship be mutually rewarding and dependable. Over all, a lively interest in people and places as they are to be experienced in the reading of books, magazines and newspapers, in listening to radio and watching television, as well as in more direct ways, is clearly conducive to good social adjustment for the cerebral palsied. The very fact that the cerebral palsied are limited more or less in their ability to move about and be active makes all the more essential a systematic and persistent effort to enrich their relationships with other persons.

A final specific type of improvement that would appear to be basic to the general personal development of the cerebral palsied is to be seen in the cultivation of good work habits, appropriate work interests, and a keen sense of workmanship. It is probably a safe generalization that good personality adjustment is seldom if ever found in the absence of a satisfying adjustment with regard to vocational aims and activities, a genuine enjoyment of work, and a pride in the results of one's labors. It is doubtful that anything else will do more to

give a cerebral palsied child a satisfying way of life than teaching him to enjoy work and to take pride in the work he does.

There is, of course, much more that could be said about the various aspects of personal growth and social adjustment of the cerebral palsied. There are more dimensions of improvement along these lines than have been considered in this paper. The ones discussed, however, are sufficient to make clear the important outlines of the problem that confronts and challenges anyone who works professionally with the cerebral palsied.

If substantial improvement along these dimensions is to be achieved in any specific case, it is essential that the team approach be used effectively, with every member of the team intelligently responsive to the *person* who has the cerebral palsy as well as to his muscles, joints, feeding problems, speech, or whatnot. It is essential also, if this improvement is to be the best for the long run, that the cerebral palsied child be regarded as being, in all truth, the father to the cerebral palsied adult. Important as it is to make childhood as happy as possible, it is even more important to deal with childhood in such a way as to insure a useful, sociable, and contented adulthood for the cerebral palsied. And, finally, it would seem clear that if improvement along these dimensions is to be accomplished at all, it is necessary to define the patient properly—and this will nearly always mean that the family will be the patient. In addition, all concerned will gain advantages from keeping everlastingly at the job of 'treating the patient that is society'—of educating the public to appreciate the plain fact that a person who has cerebral palsy is not to be judged solely by the cerebral palsy he has, but by the way he lives with it and by the kind of personal qualities he presents to anyone who is not impressed unduly by his cerebral palsy.

As a last word, it is to be pointed out that the limits and the possibilities are unknown so far as the effects of good personal adjustment are concerned. It is known that tension and athetotic movement are variable; they increase and decrease. A very extensive program of research is needed on the conditions associated with variations in athetotic movement and tension in the cerebral palsied. While waiting for the findings of this research, one can only wonder whether therapeutic procedures are in all cases rational and whether they are, in some cases, helpful at all. If, for example, a person has strong psychological reasons for being tense, will he be benefited or frustrated and dismayed by our persistent efforts to relax him? And if his emotional reasons for being tense are removed, will there be much point in trying to relax him further?

In general, the basic question is this: To what degree are the tensions and athetotic activities to be reduced by means of personality training for the cerebral palsied individual and corresponding instruction for his family, teachers, employers, and friends, including the professional therapists who work with him?

It is certain that the possibilities are worth exploring with all the resources available for the purpose. There was a time, not very long ago, when it was generally taken for granted that the stutterer's tensions were due to 'organic factors.' After much research and clinical experimentation, it has been found that this

is not the case. They are expressive of apprehensiveness and feelings of desperation varying in degree from extremely slight to relatively marked. They can be greatly reduced and even eliminated by proper retraining in evaluational response patterns. This may or may not be clearly analogous to the situation involving the problems and possibilities of the cerebral palsied. Certainly, however, it is challenging to explore as fully as possible the extent to which it is analogous in particular instances.

Teamwork In The Oregon Cleft Palate Program

Herold Lillywhite

The rehabilitation of the child with a cleft palate has received the attention of specialists in surgery, medicine, dentistry, speech and hearing for a number of years. Programs for handling cleft palate have been developed in different ways to meet the needs of local conditions. In many areas there is no unified, coordinated program for handling this kind of problem and families must find and arrange for treatment on their own. It is a characteristic of cleft palate rehabilitation that many different people must be involved in handling and treatment and it is of utmost importance that there be integration and coordination of all phases of treatment. This has not always been the case. Kantner (*1*) described the plight of the cleft palate child and suggested the following two major needs in any adequate program: (1) To make sure each specialist is aware of the whole problem so that his service is meshed into the whole program of treatment and (2) To keep the child and his family from becoming confused and emotionally disturbed.

In Oregon, as in many other places, a more adequate program is being developed to meet the needs which are peculiar to the local situation. In discussing this program, there is no claim to any superiority over other programs. There are aspects, however, that are different from others, and probably are worthy of study and comparison. Of particular interest to the field of speech should be the unique position and function of communication that is characteristic of the whole program.

To understand the Oregon program it is necessary to know something of the agency administering it. Almost all cleft palate patients in Oregon receive their care through the Crippled Children's Division of the University of Oregon Medical School. The Oregon Crippled Children's program, unlike almost all others, is centered in the Medical School rather than the State Department of Public Health. It has its own director, staff and administration, and its own building. The Division's professional staff consists of the medical director, who is a pediatrician, three medical social consultants, two consulting nurses, two physical therapists, an occupational therapist, a speech pathologist, a speech therapist, a speech therapist-audiologist, and a psychometrist-speech therapist.

Service is offered to crippled children whose families cannot bear the full expense of treatment. The Division pays for medical and dental care from private specialists. Its own staff provides physical therapy, speech therapy, and social and nursing consultation. For many years the Di-

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vision paid for treatment of cleft palate patients, but did not assume responsibility for over-all management of the patient's rehabilitation or for coordination of the various phases of treatment. The new program was instituted to remedy this situation.

Kantner (*1*) suggests that what is needed to prevent the confusion brought about by the many specialists is another specialist—one who specializes in 'wholism.' This person would: (1) Know as much as possible about the whole child; (2) Pass on all pertinent information to those who work with the child; and (3) Help the child to understand his problem and to develop and to maintain an integrated personality in spite of disruptive influences. To these requirements can be added: (4) Guide and counsel the family from the beginning to the end of treatment; (5) Bring all the specialists together to discuss treatment and to talk with parents; and (6) Provide opportunity for all the specialists to meet together to study and to discuss common problems related to cleft palate.

In the Oregon program, the speech consultant most nearly performs the function of the specialist in 'wholism.' The former Director of the Division, who initiated the present program, stated his concept of it as follows: The patient and parents should be seen by a speech consultant soon after birth and from then on periodically once or twice a year until he no longer needs treatment. Since the speech consultant would see all patients and would see them more often than anyone else, he would know the total situation better than anyone else involved, and so would seem to be the logical person to coordinate and guide the program.

In keeping with this concept, the writer was requested, in 1952, to undertake the management of the cleft palate program and to help to develop a coordinated team. This development has been most exciting and rewarding. There were, and still are, many problems, but the major one, the bringing together of the various specialists so that they could communicate with one another with confidence and respect, has largely been solved. The Oregon program differs from most in that the team is made up of many specialists who are engaged almost entirely in private practice, plus the staff of the Crippled Children's Division. This makes coordination and over-all management difficult, but it also brings more vigor and many different approaches and ideas to bear on the treatment. There are now six plastic surgeons, 13 orthodontists, two prosthodontists, a pedodontist, an otolaryngologist, a pediatrician, a speech pathologist, a speech therapist, an audiologist-speech therapist, a psychometrist-speech therapist, three medical social consultants, and a consulting nurse on the teams. Surgeons, orthodontists, and prosthodontists are assigned to cases in rotation; the other members of the team function with almost every case.

At the present time, a typical cleft palate case would be handled as follows. The cleft palate birth is reported by the attending physician either to the local Public Health Department, directly to the Crippled Children's Division, or to a plastic surgeon, who will usually refer the case to the Crippled Children's Division. In the last instance, the Crippled Children's Division will assign the patient for surgery back to the plastic surgeon who referred him, but will assume

management of the rehabilitation program. When a public health department learns of a cleft palate birth first, the referral to the Crippled Children's Division is usually a matter of routine. As soon as possible after the Crippled Children's Division receives the referral and accepts the case, appointments are made for the child and his parents with the speech consultant and the plastic surgeon assigned to the case.

At the Crippled Children's Division Center, the patient and parents will be seen first by the speech consultant, who begins the counselling and instruction that are felt to be fundamental to the entire treatment and rehabilitation program. The following matters are discussed with the parents: (1) The nature of cleft lip and palate. As much detail is given as it is felt the family can understand and use. An attempt is made to assure the family that no one is to blame, to lessen feelings of remorse, guilt, or despair, and to offer all the support and assurance that the occasion demands; (2) An outline of the important aspects of the total treatment program and the usual sequence and time of various aspects of treatment; (3) An explanation of the surgery that will be performed is given. Often it is advantageous to go into some detail, using pictures, drawings, *etc.* to show what can and will be done; (4) A description of the problems that the child and family probably will face in the areas of language development, speech problems, danger of infections and possible hearing loss, dental problems, problems of adjustment, and general care; (5) An attempt is made to impress upon the parents the necessity of early and constant dental care, the need for early medical attention in cases of upper respiratory infection, and the need to follow closely the steps in treatment; (6) Attention is given to the parent's attitudes toward the problem and their ability to understand and handle it. Every effort is made to bring about a healthy, confident, relaxed attitude toward the child's future development; and (7) Specific instruction is given as to speech development and methods of increased selective speech stimulation.

After the interview with the speech consultant, the family will be seen by a medical social consultant who begins the social case record and counselling. If there are questions at that time concerning feeding, general care, and other related problems, the family will be seen by a nursing consultant and by the pediatrician at the Crippled Children's Division, if necessary.

From this interview the parents and child go to the private office of a plastic surgeon in Portland who has been assigned to the case. Here the specific diagnosis is made, plans are made for surgery, and the family is given further explanation and instruction by the surgeon. Much of what the family has been told at the Crippled Children's Division is repeated and re-emphasized by the physician.

After this visit, the family returns home. The physician sends his recommendation to the Crippled Children's Division; succeeding appointments for surgery, speech consultation, and other care are made by the staff there. This general pattern is followed throughout the treatment program. All recommendations and reports are reviewed by the speech consultant, who coordinates all phases of care for the child and initiates treatment

procedures as the need arises. The child and family will be seen by the speech consultant and the medical social consultant about every six months. At these interviews, specific instruction is continued as outlined above, especially in the areas of speech development, dental care, and overall management. During these visits, the current needs and problems of the patient and family are determined and then steps are taken to alleviate them. The services of any of the other staff members or private specialists are available when needed.

Surgery for cleft palate in the Portland area generally follows the pattern of lip surgery at six to eight weeks and palate surgery at eighteen to twenty-four months. There are variations, however, to fit individual problems. The surgeon's recommendations are followed in all surgery procedures, but he often makes his recommendations after consultation with the other members of the team and with other treatment plans in mind.

When the child is three, he is given his first dental examination by a pedodontist working jointly for the Dental School and the Crippled Children's Division. This examination includes a dental survey, dental casts, X-rays, and bone growth measurements. The same examination is repeated yearly for five years or oftener if needed. Reports of the examinations are sent to the Crippled Children's Division. Any care recommended in the reports is provided by the Crippled Children's Division, with the exception of routine dental care. However, local public health departments are most effective in assisting with dental care.

Active speech therapy is initiated when the child is about four, if it is needed and available. This therapy is provided at the Crippled Children's Division speech and hearing clinic, one of the private agencies in Portland, the speech clinic at the University in Eugene, one of the colleges of education in Monmouth, Ashland, or La Grande, or in a public school when the child reaches school age.

Hearing is checked from birth on, with audiometric testing done as soon as the child is old enough to test. Hearing problems occurring before age three are referred to one of the otolaryngologists used by the Crippled Children's Division for cleft palate problems. At the age of three the child is given a complete examination by an otolaryngologist.

Just before the age of five, the child is given a psychometric examination by a staff psychologist. When the child is five, he is brought to the Crippled Children's Division where he is seen for the first time by all the specialists involved in his care. The patients to be presented at this clinic are selected according to need by the speech consultant who presents the case to the panel and conducts the clinic. At the clinic, the child is examined by the specialists who then discuss what treatment to recommend. When the panel has agreed upon a treatment plan it is discussed with the parents and any questions they have are answered by the panel. After this, the social consultant talks with the family about details of the treatment plans and any other problems that might arise. Much attention is paid at this clinic to the total problem, including family adequacy, the child's mental capabilities, his adjustment, his social maturity, and ability

to carry through with treatment plans, etc. Extensive treatment must be justified in light of the over-all picture. Adequacy in communication is a basic consideration, but it is evaluated on the basis of the individual child rather than any fixed standard of performance.

If orthodontic treatment is recommended by the panel, patients living in or near Portland are assigned to the orthodontist attending the clinic. Patients who are not from Portland are assigned to one of the cooperating orthodontists in Eugene, Salem, Medford, or Klamath Falls. All prosthodontia is done at the Dental School in Portland by the prosthodontist assigned to this program. Further treatment plans are carried out by the Crippled Children's Division and are coordinated by the speech consultant. If need arises, the child will be rechecked by the panel as the speech consultant or one of the other specialists recommends. When the child gets into school, the Crippled Children's Division works closely with the schools to help with his further development. In this manner he is followed until he no longer needs care or until he reaches age twenty-one.

There are a number of problems remaining to be solved before this team becomes adequate for the rehabilitation of the cleft palate child. Probably most important is the need to bring about team consultation on all patients soon after birth rather than waiting until part of the treatment has been done. Some definite movement in that direction already has taken place and a few newborn cleft palate patients are being seen in the clinic at the request of one or other of the specialists. It is hoped that within a few years, all newborn cleft palate patients will be seen by the panel of specialists before any treatment has been undertaken.

The second problem is to complete the team with dentists who can help keep the teeth in good repair. At present, this is a major difficulty. Another problem is to bring about more complete understanding and acceptance of the team function on the part of all the specialists participating. A few individuals still tend to work in comparative isolation without reference to other members of the team.

Undoubtedly there is a question as to the advisability of trying to bring about close coordination among so many different specialists. It would be much easier to integrate the work of a team made up of one person in each specialty. Most other cleft palate teams have found this to be the case. However, the Oregon program is developing according to local conditions and limitations that require the use of many specialists. In spite of the problems this plan creates, it has one value which may over-balance the problems. A large number of medical, dental, and speech specialists in the State are directly involved with the rehabilitation of cleft palate children. As better coordination and more effective integration are achieved, many interested individuals come to work closely together with mutual trust and confidence. From their improved relationships come many related values for the child, the participants, and the community.

Even at this early date there are a number of positive values apparent. The most striking is the change in the attitudes of most of the participating members of the team. Some of the specialists have revised greatly their concepts concerning the func-

tion of other specialists. This is most notable in the attitudes of most of the plastic surgeons toward the prosthodontists and vice versa, and the attitudes of the surgeons, orthodontists, and prosthodontists toward the functions of the speech consultant and speech therapists. It is now not uncommon for the specialists to request consultation and panel evaluation for patients who present unusual problems.

Another very evident value is that the team approach has become an exciting learning experience for all those participating. The free discussions of problems have served to open many new avenues of information and exploration. Experimentation with new approaches now is much in the thinking of the participants. In keeping with this attitude, tabulation of pertinent data on all patients is being carried on in the belief that eventually this data should yield valuable information concerning cleft lip and palate. This is in addition to the extensive data being gathered at the Dental School from the yearly examinations.

The recognition of the speech problems and the attention given to speech by all the specialists has been surprising and heartening. Many times the different specialists have indicated that the final decision with respect to what shall be done rests upon what is best for the child's speech. The ultimate goal of all of the treatment is to provide the child with adequate structure and skill so that his ability to communicate can be developed to meet his needs. Within two years, a noticeable change has taken place in the reports that the various specialists send back to the Crippled Children's Division. Almost without exception, these reports now mention the child's speech and indicate that this ultimate goal is uppermost in their thinking. Many referrals are made by the various specialists to the speech department for opinion as to what dental and surgical procedures would be best for the patient's speech. Members of the speech department are freely accepted as observers when surgery is performed and when orthodontic and prosthetic procedures are taking place.

The fact that the Oregon program is coordinated by the speech consultant on the team is somewhat unusual and probably accounts in part for the attention that is given to the speech aspects of the total program. This program appears to be quite unique with respect to the function of the speech consultant on the team and the provision for consistent counselling with respect to speech and hearing during the patient's early years. It is considered highly important that the parents understand something of the nature of speech development from the beginning. It has been found that most cleft palate patients will present a serious delay in speech development which is related only indirectly to the anatomical abnormality. It seems to be caused more by the trauma, the psychological problems, the errors in handling, and the interruptions in speech development caused by surgical procedures in the first two years. It is felt that early and consistent counselling will prevent much of this trouble. The Oregon program has been in operation long enough now to begin to show that this assumption is correct. A secondary, but important, result of the counselling is that it is possible

very early to relieve many of the abnormal feelings on the part of parents concerning their problem. This is tremendously important to the entire rehabilitation program.

The final and most important result of this entire program is that the patient gets immeasurably better care through the better functioning of the specialists, through the much better understanding of his parents, and through the improved atmosphere in which the rehabilitation is taking place.

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Socio-Economic Factors In Stuttering

John J. Morgenstern

Among the many factors which may influence the incidence of stuttering in a given culture, the socio-economic forces have never been given careful and thorough study by researchers in the field of speech pathology. Two chief concerns are: what strata of the population are affected by symptoms of stuttering and what explanation could possibly account for any varying incidence? The present study discusses the socio-economic factors affecting the incidence of stuttering in a representative population of Scotland.

In order to overcome certain difficulties in such a study, it was necessary to restrict the sociological investigation to purely quantifiable factors, and to quantify the various socio-economic groups in Scotland by assigning code numbers to the occupations and professions of the parents or guardians of sufficiently large numbers of stuttering children as to allow for a statistical comparison. In addition, the investigation sought to determine the significance, in stuttering incidence, of the family position of the stutterer and the age of his mother.

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Procedure

The most important step in the procedure was to take advantage of the norms for siblings (5) and the socio-economic norms (4) which had been produced from the 1947 Mental Survey, conducted by the Scottish Council for Research in Education. The norms for siblings constitute the actual distribution in 1947 of over 70,000 11-year-old children by family size and position in family. The socio-economic norms are those of a random sample of 10% of the entire Mental Survey, amounting to over 7,000 11-year-old children born on the first three days of each month in 1936. The availability of these norms, together with the code-numbers and general procedure of the Mental Survey, provided an enormous time-saver and eliminated the necessity of obtaining large numbers of controls whose nature is so frequently open to question.

The problem of the standardization of diagnosis was resolved by the use of qualified speech therapists as the selectors of stuttering children. The training of these speech therapists had been standardized by the London College of Speech Therapy, and all of them hold a diploma accredited by this institution. No other available judges could be considered more competent, nor could be more likely to use common criteria by which to diagnose stuttering children.

TABLE 1. Classification by population-density of location of the home (LH) in different areas of Scotland.

Location of Home (LH)	*Code Number*
Cities (4 in Scotland)	1
Large town (Population over 20,000, other than Cities)	2
Small town (Population from 10,000 to 20,000)	3
Other areas (*All* other places)	4

Stuttering children were accumulated in the following manner. A letter was sent to the supervisors of all schools included in the survey, asking them to return the names of all children in the 6th and 7th grades (ages 10-13) who were even vaguely suspected of having stuttered within the last year. A return was requested even in the event of no 'stutter-suspects.' Teachers were asked to send in the name of any child who could possibly be considered a stutterer according to the following lay definition:

> A child may be considered to stutter if, from time to time, he is forced to interrupt his natural flow of speech by the repetition of any sound, or by a total 'blocking.'

Special schools were excluded in all areas since these were known to have a significantly higher incidence of stuttering. When the names of all the 'stutter-suspects' had been received, appointments were made for the speech therapists of the area to see the children and confirm the diagnosis. (The children were asked to read and make spontaneous conversation for five to ten minutes.) Those children who were not actual stutterers, in the opinion of the interviewing speech therapist, were dismissed. Children found to be stutterers were then given a brief oral questionnaire, and the answers were noted by the speech therapist on prepared forms.

The questionnaire provided the following information: name, sex, date of birth, address, name of school, date and nature of onset of stuttering, number, age, and sex of siblings, occupation of father or guardian, number of rooms in the home (to include kitchen but not bathroom), and number of individuals permanently resident in the home, including any temporarily resident in the Armed Forces.

The Survey

The survey was made in the schools of five geographical areas in Scotland,

TABLE 2. Comparative view of stuttering incidence in Scotland by population density, based on a survey of 6th and 7th grade children in five different geographical areas.

Population Density	*Numbers Surveyed*	*Number of Stutterers*	*Number of Boys*	*Number of Girls*	*Boy-Girl Ratio*	*% Stuttering Incidence*
LH 1	4 963	71	57	14	4.1 – 1	1 43
LH 2 & 3	6 986	78	65	13	5 0 – 1	1.12
LH 4	17,550	206	167	39	4.3 – 1	1.17
Total	29,499	355	289	66 (Mean)	1.4 – 1 (Mean)	1.20

TABLE 3. Occupational class categories (with occupation numbers) and definitions of each class used in classifying occupations of fathers or guardians in both the 1947 Mental Survey and the present study. Note that 61, 62, 6X, 63 all exclude agricultural.

Occupational Class	*Father's Occupation Number*	*Definition*
1	10	Professional class—includes higher ranks of civil service, etc., Armed Forces officers.
	20	Employers of 10 or more workers—include chairmen, directors, managers of large firms—but exclude farmers.
2	30	Self-employed or employing less than 10 workers—exclude occupations 10, 70, also casual workers, etc. Include small employer, shopkeeper, and businessman.
3	41	Salaried employee (non-manual) paid by month or longer Includes all shop and factory managers.
	42	Salaried employee (manual) paid by month or longer. Exclude those in class 10, 20, 70.
4	51	Non-manual weekly wage-earner—mainly clerical.
	52	Non-manual weekly wage-earner—others, e.g., shop assistants, insurance agents, etc.
5	61	Manual weekly wage-earners—skilled (e.g. Tradesmen : plumbers, carpenters).
6	62	Manual weekly wage-earners—semi-skilled (e.g. Machine tender, driver).
	6X	Manual weekly wage-earners—skill unknown
7	63	Manual weekly wage-earner—unskilled (e.g., laborer).
8	70	Farmers—employers, managers, self-employed.
9	80	Agricultural—non-managerial.

representing rural as well as urban populations. The classification of the population-densities was made in the same way as in the 1947 Mental Survey (*4*), as shown in Table 1.

In compiling the results of the survey, it was necessary to combine LH 2 and LH 3, so as to make the numbers large enough for valid statistical comparison. Table 2 gives a comparative view of the survey results.

Some attempt was made to determine the reliability of the survey. Since it has been generally found that stuttering incidence fluctuates around 1%, statistical comparison of the incidences shown in Table 2 was made with a hypothetical 1% incidence, in an identical number of children for each LH. The comparison showed no significant deviation from an 'expected' 1%. This is the best available test for reliability, and it indicates that the survey results are reliable.

Further reference to Table 2 shows that density of population in Scotland does not affect the incidence of stuttering significantly since there was no significant difference found between any two of the three incidences shown therein.

The next consideration was the influence of occupational class and occupancy rate on the incidence of stuttering. The terms occupational class and occupancy rate were borrowed directly from the 1947 Mental Survey (*4*). As shown in Table 3, the

fathers' (or guardians') occupations were first given numbers, and these in turn were conveniently grouped into nine occupational classes (*4*).

The present study made use only of the first column shown in Table 3, 'Occupational Class'; the second column, 'Father's Occupation Number,' is included for reference help in the definition. Wherever the information on the oral questionnaire forms was sufficiently clear, a child's father or guardian was given one of the nine occupational class numbers.

The occupancy rate (*4*) is shown in Table 4.

With the normative data from the 1947 Mental Survey (*4*), based on approximately 7,000 11-year-old children drawn at random from the entire Scottish school population, it was now possible to calculate 'expected' frequencies for the present study in all the occupational class numbers (OC) and occupancy rates (OR), according to the different population-densities (LH) listed in Table 1. After this step, the same actual findings (for 11-year-old stutterers) for OC's and OR's (by LH's) were compared statistically and the chi-square test of significance of the difference was applied. LH 2 and LH 3 were combined (as in Table 2) and OC's 1-4 and 7-9 were combined to give the figures statistical validity. Table 5 shows an overall comparison of the findings for stuttering children with 'expected' findings.

From these results it is seen that there is a highly significant difference in the distribution of both OC and OR (occupational class and occupancy rate) from the distribution which could have been expected by chance. Johnson (*1*) cites Darley's study of 50 stuttering children, 80% of whom were in the middle and upper socio-economic classes, and infers that upward mobility or drive to rise socio-economically is a socio-economic factor in raising stuttering incidence.

In the present study, stutterers in OC 6 (semi-skilled weekly wage-earners) exceeded the 'expected' number by a greater amount than any other OC, and this was true regardless of LH (population-density). Furthermore, those living in OR 2 (1 and less than 2 per room) exceed the 'expected' number by a greater amount than those in any other OR, regardless of LH. In rural areas (LH 4), both skilled and semi-skilled groups (OC 5 and 6) had a higher stuttering incidence than the middle and upper classes (OC 1-4).

Chi-square treatment of the data in Table 5 showed a statistically signifi-

TABLE 4. Code classification of occupancy rate (OR) used in both the 1947 Mental Survey and the present study.

*Number of Persons per Room**	*Code Number (OR)*
Fewer than 1	1
1 and less than 2	2
2 and less than 3	3
3 or more	4

*Number of rooms in home includes kitchen but not bathroom; number of persons in home includes permanent residents and those in the Armed Forces.

TABLE 5. Comparison of actual findings for stutterers with "expected" findings of distribution of Occupational Class (OC) and Occupancy Rate (OR), according to population density (LH), as listed in Table 1. OC information was not available for a few children and OR information was missing for a few more.

	Occupational Class				
	1–4	5	6	7–9	*Total*
LH 1					
No. stutterers	16	26	32	10	84
Expected no.	19.388	32.586	13.348	18.664	83.986
LH 2 & 3					
No. stutterers	13	12	33	13	71
Expected no.	13.692	28.536	15.075	13.738	71.041
LH 4					
No. stutterers	29	80	52	34	195
Expected no.	33.895	59.926	35.983	65.215	195.019
Total Survey					
No. sutterers	58	118	117	57	350
Expected no.	66 975	121.048	64.406	97 617	350.046

	Occupancy Rate				
	1	*2*	*3*	*4*	*Total*
LH 1					
No. stutterers	5	46	20	9	80
Expected no.	4.831	30.817	25.637	18.828	80.113
LH 2 & 3					
No. stutterers	7	48	7	4	66
Expected no.	4 068	26 216	24.182	11.526	65.992
LH 4					
No. stutterers	29	125	21	13	188
Expected no.	19.889	85.801	53.276	28.935	187.901
Total Survey					
No. stutterers	41	219	48	26	334
Expected no.	28.788	142.834	103.095	59.289	334.006

cant excess over expected number of stutterers in OC 6 in all population-densities. In LH 4 (rural), there was also a significant excess of stutterers in OC 5. Both differences were significant at the .01 level.

These findings may be understood in terms of Johnson's (*2*) diagnosogenic theory of stuttering which suggests that parental anxiety over their children's fluency may have untoward effects. If, within a culture prizing fluency, a class or socio-economic group exists, which attaches even higher importance to speech fluency than other socio-economic groups, then one might expect this group to suffer from higher stuttering incidence.

This reasoning might well account for the unusually high incidence of stuttering found among children of Scottish semi-skilled wage earners, and the comparatively low stuttering incidence found among unskilled laborers, industrial and agricultural. In the first instance, we have a segment of the population which has received some degree of training or skill, but not enough for 'tradesman' (skilled worker) status. Such men, and their wives, may well see the socio-eco-

nomic advantages which more training and education can bring in a competitive society. Because of economic pressures, they may be extremely desirous that their children should make an achievement higher than their own. The advantages of linguistic fluency as a means of achieving higher occupational status is not unkown to them. It may be argued that, more than any other single Scottish occupational class listed in Table 3, those in OC 6 desire higher status. Furthermore, their children may be said to have the greatest possibility of improving on the occupational status of their parents. The high proportion of stuttering children in OC 6, therefore, lends further support to Johnson's conception of stuttering as an effect of (1) parents' hyper-anxiety over the non-fluency of young children and (2) generalization of this anxiety to the children whose reinforced fear of their own non-fluency thereupon multiplies the hesitations and repetitions anew.

Likewise it may be observed that the value placed upon speech fluency in the homes of urban and rural unskilled workers is likely to be a good deal less than anywhere else in Scottish culture. The low incidence of stuttering found in these homes supplies corroboration of the above reasoning.

The next concern was family size in stuttering incidence. Norms for size of families for 11-year-old children, according to population density, were available (*4*). The last column of Table 6 shows the number of siblings found for 11-year-old stutterers. When these data were treated by the chi-square method, no significant difference in family-size was found between the 11-year-old stutterers and the norms, p being less than .95. In other words, the number of siblings which a child has does not affect the possibility of his becoming a stutterer.

Another approach to the sibling data lay in the question of whether position in the family has any effect on stuttering incidence. It was found that 230 11-year-old stutterers had 275 older siblings and 250 younger siblings. From the norms for 'family-position' in the 1947 Mental Survey (*5*), it was calculated that a random sample of 11-year-olds, 4/5 boys and 1/5 girls (like the stutterers), should have about 53% older siblings and 47% younger siblings. No significant difference was found in the corre-

TABLE 6. Number of siblings per 11-year-old stutterer, by population density (LH).

Population Density	*Number of 11-year-old Stutterers*	*Total Children in Family including Stutterer*	*Mean Number of Children per Stutterer's Family*	*Mean Number of Siblings per Stutterer*
LH 1	83	261	3.15	2.15
LH 2	15	52	3.47	2.47
LH 3	19	64	3.37	2.37
LH 4	113	416	3.68	2 68
Total	230*	793	(Mean) 3.45	(Mean) 2.45

*Only this number of the 355 stutterers were age 11. Since all sibling calculations were compared with normative data for 11-year-old children, the non-11-year-olds were excluded from statistical computations on the sibling data.

sponding proportion in 11-year-old stutterers, p being less than .90. Hence, being a younger or an older child in the family does not affect the likelihood of stuttering.

A more precise measure of the relevancy of family-position in stuttering incidence was possible because of the availability of norms (*5*) for 70,000 Scottish 11-year-olds on how many were only children, first in a family of two children, second of two children, etc. No significant difference in this family-position measurement was found between 184 11-year-old boy stutterers and the norms, and between 37 11-year-old girl stutterers and the norms. Furthermore, the survey did not contain a significantly high or low proportion of only children among the 11-year-old boy stutterers (27 out of 186). An even lower-than-expected proportion of only children occurred among the 11-year-old girl stutterers (one out of 44), possibly because N was so small. It was also found that the proportion of last-born 11-year-old boy and girl stutterers was not significantly different from what could have been expected.

A final approach to the sibling data lay in the investigation of the mean number of years difference between stutterers and their nearest siblings as compared with non-stutterers and their nearest siblings. In an investigation of 522 stutterers, Rotter (*3*), found stuttering children significantly further removed from their nearest siblings than non-stuttering children. In the present study, two areas containing about 14,000 children from 5 to 15 provided the opportunity to examine this question since all of the children therein were screened and speech-diagnosed in the usual procedure. If, therefore, a stutterer's sibling (who was between the ages of 5 and 15) was not listed as a stutterer as well, it was inferred that this sibling was a non-stutterer. It was possible to make 131 calculations for these non-stutterers for the number of years to their *nearest succeeeding* sibling, and 129 like calculations to their *nearest preceding* sibling. These findings were then compared statistically in two ways: (1) with the same findings for the very stutterers in these two areas from which the non-stutterer norms were drawn (controlling socio-economic status of the families) and (2) with similar findings for stuttering children of two other areas. In both cases there was a significantly greater number of years between stutterers and their nearest preceding and succeeding siblings than between non-stutterers and their nearest preceding and succeeding siblings (at the .01 level).

Hence, the present investigation confirms Rotter's findings that there is a significantly large difference in years between stutterers and their nearest siblings as compared with non-stutterers and their nearest siblings. A hypothesis more closely related to speech than Rotter's theory of pampering as a stuttering-genetic factor may be suggested to account for the findings, as follows:

Widely-spaced children receive greater individual attention from their parents (especially mothers) than children who follow each other in close succession. Parents of widely-spaced children are therefore in a better position to supervise and stimulate the child's development in every way, particularly linguistically. Widely-spaced children may thus receive a greater amount of correction of their early,

non-fluent speech, which may tend to produce anxiety and self-consciousness in the child, in regard to his speech. Hesitations and repetitions (to avoid correction by his parents) may become so strong a habit as to gain functional autonomy, leading ultimately to the stuttering habit in all situations of the slightest linguistic stress.

Admittedly this hypothesis of itself does not account for the failure to find a significantly higher proportion of only-children among stutterers.

Norms were obtained for the dates of birth of mothers in only 46 cases, in one area, where the writer visited the homes in person. By dividing the mothers' ages into three categories (43 or over, 38 to 42, 37 and less), it was possible to make a statistical comparison between the ages of 11-year-old stutterers' mothers and those of a random sample. No significant difference was found between the observed and expected data, p being less than .8. Hence, it is suggested that the age of the mother is not relevant to stuttering incidence.

Summary and Conclusions

A survey of 29,499 school children in five geographical areas of Scotland was made to determine possible socio-economic factors which influence the incidence of stuttering in a given population. Sociological norms were used which were reliable and which aided in arriving at significant deviations from these norms. The following are the findings:

1. Stuttering incidence does not vary significantly according to geographical area (of those studied), nor according to population density (in the areas surveyed).

2. The ratio of boy-to-girl stuttering incidence ranged from 4.1−1 to 5.0−1, with a mean of 4.4−1.

3. In all areas there was a significantly high proportion of stutterers whose fathers or guardians are semi-skilled manual weekly wage-earners, e.g., machine tenders, drivers (OC 6). In heavily and sparsely populated areas, there were significantly few stutterers whose fathers or guardians were unskilled laborers, industrial or agricultural (OC 7 and OC 9). Sparsely populated areas also produced a significantly high proportion of stutterers whose fathers were skilled manual weekly wage-earners (OC 5). No significant differences from the expected incidence were found among children whose fathers or guardians had middle-and-upper-class occupations (OC 1-4).

4. Stuttering incidence is negatively correlated with crowded housing in all areas, although in some cases this finding may be unreliable due to housing construction since the norms of occupancy rate were established. Nevertheless, this finding is in accord with the two-few-laborers finding (see 3 above). A significantly high proportion of children living in OR 2 homes (1 and less than 2 per room) was found among stutterers in all areas; in rural areas OR 1 (fewer than 1 per room) also produced a significantly high proportion of stutterers, while the more crowded homes (OR 3 and OR 4) both produced a significantly low proportion.

5. Sibling-status has almost no effect on stuttering incidence. The distributions observed for stuttering children produced no significant difference from expected distributions in the following measurements: (a) number of siblings; (b) ratio of older-to-

younger siblings; (c) number of first-born children; (d) number of last-born children; (e) number of only-children, although a small number of cases suggested that only-child girl stutterers are significantly few; and (f) position in the family.

6. Stuttering children were found to be significantly further separated from their nearest siblings (before and after) than non-stuttering children.

7. Age of mother was found to have no effect on the incidence of stuttering in a study of 46 children.

Acknowledgment

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Speech Articulation Problems Associated With Placement Of Orthodontic Appliances

Eugene W. Feldman

It is commonly believed that there is an occasional inter-relation between oral deformity and defective speech. There is still a question about the exact relationship of speech defects to malocclusion. Kessler (*2*) says, 'As to the role of dentistry and all of its specialties, we know that speech defects can be caused by malocclusion, loss of teeth, tongue tie, incorrect dentures and bridges, cleft palate, shortness of soft palate, and fear of showing unsightly dentition.' From a random sampling of 100 children with articulation defects in the public schools of Cleveland, Kessler found only seven with normal occlusion. In the treatment of malocclusion with orthodontic appliances, the question arises as to what articulation defects will be initiated by their presence. Stolzenberg (*3*) says that speech correction is required during orthodontic treatment, and that the patient should be referred for speech therapy.

Orthodontic mechanisms can be placed to interfere with the tongue, teeth, hard palate, lips, and mandible. Thus, most of the articulators of speech can be subject to interference, and all of the above can be interfered with at one time. It is possible, then that in treating an oral deformity the orthodontist, unawares, is concomitantly inducing defects of articulation?

It is the purpose of this study to examine the effect on speech of the insertion of orthodontic appliances. Many speech therapists have assumed that consonant sounds play the more important part in the intelligibility and social effectiveness of speech, and the present study is primarily concerned with consonant rather than vowel articulation. An attempt is made to compare the speech of the patient before and after placing appliances and to compare the effect of the type of appliance used on the frequency of speech error.

Source of Material

The 32 patients in this study were made available by the Orthodontic Clinic of the School of Dentistry of the University of Pittsburgh. The patients ranged from 9-18 years of age. The type of malocclusion presented by any one patient was disregarded as being immaterial to a study of this type.

The source of the speech material was that of Dietze (*1*) and consisted of one set of 31 units, typed on individual white cards 3 x 5 inches. Each unit consists of a single word, usually

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a spondee, a phrase, or a short sentence containing from four to 14 consonant elements. Approximately 205 consonant elements compose the set. Where a phonetic element in a sentence appeared to become lost because of the nature of connected speech, it was not included in the count, *e.g.*, [d] in 'and'. The set was devised to contain the correct proportion of each of 23 consonant elements in accordance with frequency values. Thus, the list contains 24 [t], 21 [n], 20 [r] sounds, etc., but only one [tʃ] and [dʒ] and no [ʒ], since this latter sound is too infrequently used to be included in a sample of 200. All three positions, generally, have been included, but not according to any pattern. Dietze says, 'In the final analysis a listener's judgment, based on observation through a variable sense modality, is the only criterion of articulation, and of its sub-standard or up-to-standard character.' This fact must be taken into consideration in an interpretation of the results obtained.

A practice list of 12 cards was used to acquaint the patient with the general form to be followed when reading. Vocabulary difficulty was within the ability of third grade pupils.

Two groups of patients were used: (B) those with bite-planes or Hawley retainers, and (L) those with labio-lingual appliances or labio-lingual with Johnson appliances. In Group B, five patients wore retainers and these had worn orthodontic appliances previously; four patients with bite-planes had not worn appliances previously. The reason for the distinction between Group B and Group L is the much larger bulk of the bite-plane or retainer as compared with the labio-lingual or labio-lingual with Johnson appliances. Three patients wore labio-lingual appliances in conjunction with bite-planes and were included in the list of nine patients wearing bite-planes or retainers. Three patients who were to receive treatment with the Edgewise technic were not included in the study since several visits would normally be required to place the bands and arch-wires.

Method of Recording

The recording procedure was carried out in any one of four rooms made available by the School of Dentistry. For some patients a phonetic transcription was made by two graduate students of the Department of Speech of the University of Pittsburgh who were present with the patient and the experimenter; for the majority of patients the Sound tape recorder was used.

All patients upon entry into the

TABLE 1. Summary of articulation errors for all subjects. The first figure in each column is of the first auditor; the second figure is of the second auditor. (For computing statistical data, the larger of the two figures was used.) Group B = patients with bite-planes or Hawley retainers; Group L = patients with labio-lingual appliances or labio-lingual with Johnson appliances.

	Number of Subjects	*Number of Errors*		
		Test 1	*Test 2*	*Test 3*
Group B	9	0–0	13–13	0–0
Group L	23	4–4	13–12	3–3
Total	32	4–4	26–25	3–3

TABLE 2. Comparison of subjects making errors on Test 1 and Test 2.

		Errors on Test 2						*Total number of subjects making errors on Test 2*
		0	*1*	*2*	*3*	*4*	*5*	
Errors on Test 1	0	19	3	1	1	3	1	28
	1	3	1	0	0	0	0	4
Total number of subjects making errors on Test 1		22	4	1	1	3	1	32

room were put at ease through conversation. When the tape recorder was used, the patient usually showed interest in it, and when told that after the test there would be a 'playback' he always proved cooperative. The practice list was read into the microphone with the recording apparatus turned off to acquaint the patient with holding the microphone and reading the list simultaneously. During the preliminary test, the examiner made sure that defective articulation did not result from reading difficulty and coached the patient on any difficult words.

When the phonetic transcriptions were being made, the patient and examiner faced the two graduate speech students. By displaying the stimulus words on cards, one unit at a time, the examiner was able to allow for sufficient time to transcribe the responses. When the tape recorder was used, less time was given between units, since the data would be analyzed at a later time. In this case, with the patient holding the microphone, the stimulus material was also shown by the examiner one unit at a time. The recording required only a few minutes for each patient. When completed, the tape was played back to determine whether it was satisfactory and to allow the patient to hear the recording of his own voice.

The original test for all patients was given before any appliances were inserted. The second test was given within an hour after the appliances were inserted. The third test was given one to three weeks after the appliances were worn by the patients. For all three tests, the stimulus material remained constant.

Results

A summary of the errors which occurred during the three tests is shown in Table 1. It will be noted that patients who have worn orthodontic appliances for one to three weeks, particularly bite-planes, retainers, and labio-lingual or labio-lingual with Johnson appliances, do not have more articulatory errors than originally present.

Four patients had one articulatory error each on Test 1. Two of these patients retained an error on Test 3; two did not retain an error on Test 3. In only one instance did a patient who did not make an error on Test 1 make an error on Test 3.

Table 2 shows the number of subjects making 0 or 1 error on Test 1, according to the number of errors on Test 2. There were considerably more errors on Test 2 than on Test 1 or Test 3; the number of subjects making errors on Test 2 was only 10 of the total of 32.

TABLE 3. Comparison of subjects making errors on Test 2 and Test 3.

		Errors on Test 2						*Total number of subjects making errors on Test 3*
		0	*1*	*2*	*3*	*4*	*5*	
Errors on Test 3	*0*	21	3	1	1	2	1	29
	1	1	1	0	0	1	0	3
Total number of subjects making errors on Test 2		22	4	1	1	3	1	32

Six of the 10 patients with articulatory errors on Test 2 wore bite-planes or retainers; three patients with bite-planes or retainers made no errors. Thus, according to these data, patients with either bite-planes or retainers are more likely to make errors within an hour after placement than are patients with labio-lingual or labio-lingual with Johnson appliances.

In Table 3 are shown the number of subjects who made 0 or 1 error on Test 3, according to the number of errors which those subjects made on Test 2. In effect, Table 2 shows that the group of subjects employed in the study normally made very few errors, but that the errors increased considerably for some cases when orthodontic appliances were inserted. Table 3, however, shows that after the appliances had been worn for a short time the resulting articulatory difficulties were overcome almost if not entirely.

Orthodontic appliances in some instances can alter patterns of speech temporarily, but at the end of one to three weeks the patient apparently accommodates for their presence and overcomes any hindrances caused by the appliances. It may be noted that this conclusion is in disagreement with Stolzenberg (*3*).

According to the findings of this study, it does not seem necessary to have patients take any particular speech training exercises while undergoing orthodontic treatment; patients easily accommodate without instruction to the presence of interferences with the tongue, lips, hard palate, mandible or teeth.

Summary

The purpose of this study was to investigate the speech articulation problems associated with placement of orthodontic appliances. Thirty-two patients from an age range of 9-18 years were selected from the Orthodontic Department of the School of Dentistry of the University of Pittsburgh.

Three articulation tests were given to each patient. The first test was given before appliances were inserted, the second test was given within an hour after insertion, and the third test was given after the patient had worn the appliances for one to three weeks. The tests were transcribed by two judges, either from direct speech or from a tape recording.

For all patients as a group, regardless of the appliance worn, comparisons were made between Test 1 and Test 2, and between Test 2 and Test 3. Further, a comparison was made on Test 2 between the group wearing bite-planes or retainers and

the group wearing either the labio-lingual or labio-lingual with Johnson appliances.

It was found that patients wearing orthodontic appliances for one to three weeks did not make more errors in articulation than were originally present. In some instances appliances do disturb speech patterns temporarily, but the patient's compensatory activities tend to overcome the disturbance and normal speech returns. It is apparently unnecessary to recommend speech training exercises to patients undergoing orthodontic therapy.

Acknowledgment

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Recovery Pattern From Auditory Fatigue

James F. Jerger

Recent studies of the recovery of the auditory threshold after intense stimulation reflect some disagreement. On the one hand, the exhaustive investigations by Harris (*2*) and Hood (*4*) consistently revealed a monotonic recovery pattern. The threshold shift was maximal immediately following cessation of the fatiguing stimulus, then gradually decreased to the prefatigue level.

On the other hand, the equally exhaustive study by Hirsh and Ward (*3*) showed, in some subjects, a diphasic recovery pattern. During the first minute after cessation of the fatiguing stimulus, the threshold shift curve showed the customary decreasing pattern. In the region between one and three minutes, however, the recovery curve briefly reversed its direction. Instead of continuing to decrease, the threshold shift increased, then levelled off, and finally resumed its former decreasing pattern. Thus, a secondary maximum, or 'bounce' was superimposed on the otherwise monotonic decreasing pattern of the recovery curve. Hirsh and Ward cited a precedent for their finding in the earlier work of Bronstein (*1*). The bounce phenomenon has since been confirmed by a number of other investigators (*5*, *6*, 7).

Harris (*2*) attempted to explain the discrepancy between his results and those of Hirsh and Ward on the basis of tinnitus and the nature of the threshold tracing signal. He suggested that the bounce phenomenon might be due to the subject's inability to discriminate between a continuous tone at threshold and the tinnitus which often follows pure-tone stimulation. Harris further suggested that the absence of bounces in his data was due to his use of a pulsed threshold tracing signal which negated the adverse effect that tinnitus would have had if the signal had been continuous.

One difficulty with this explanation is that the use of a continuous rather than an interrupted trace signal does not appear to be critical to the demonstration of the bounce phenomenon. Hirsh and Ward found it with clicks, Kopra (7) found it with a tracing signal similar to that used by Harris, and the writer (*6*) has found it with short-tone trains in which the duration of the short tone ranged from 5 to 500 milliseconds.

The possible role of tinnitus in producing the phenomenon is less easily evaluated. However, extensive observations by Hughes (*5*) suggest that, although tinnitus is frequently an accompaniment of the bounce, it does not appear to be the causative agent.

An alternative hypothesis is suggested by the fact that no other in-

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vestigator has worked with the fatiguing intensities employed by Harris. The maximum intensity used by Hirsh and Ward, for example, was 120 db (SPL), whereas Harris used intensities ranging from 120 to 140 db (SPL). This suggests the possibility that the intensity of the fatiguing stimulus might be critical to the appearance of the secondary maximum, or bounce, in the recovery curve. The present study investigated this hypothesis by plotting recovery curves for a train of 4000-cps short tones after varying levels of intense stimulation at 3000 cps.

Apparatus and Procedure

The source of the 4000-cps short tones used to trace threshold was a magnetic tape recording. Each recorded short tone rose from the time axis to maximum amplitude in one millisecond, remained at maximum amplitude for 300 milliseconds, then decayed to the time axis in one millisecond. The silent interval between short tones was 1200 milliseconds.

The output of the tape recorder passed through a Békésy-type, automatic attenuator mechanism, next through a band-pass filter set at 4000 cps, then to the normally closed contacts of a relay, and finally to a PDR-8 earphone mounted in a doughnut cushion.

By means of a switch controlling the direction of rotation of the motor-driven attenuator, the subject could oscillate between just-hearing and just-not-hearing the train of short

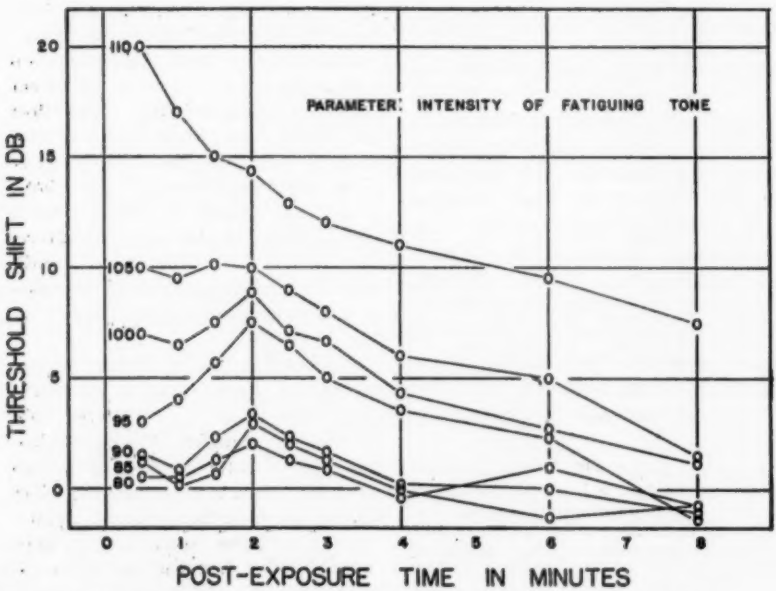

FIGURE 1. Mean threshold recovery curves following various fatiguing intensities.

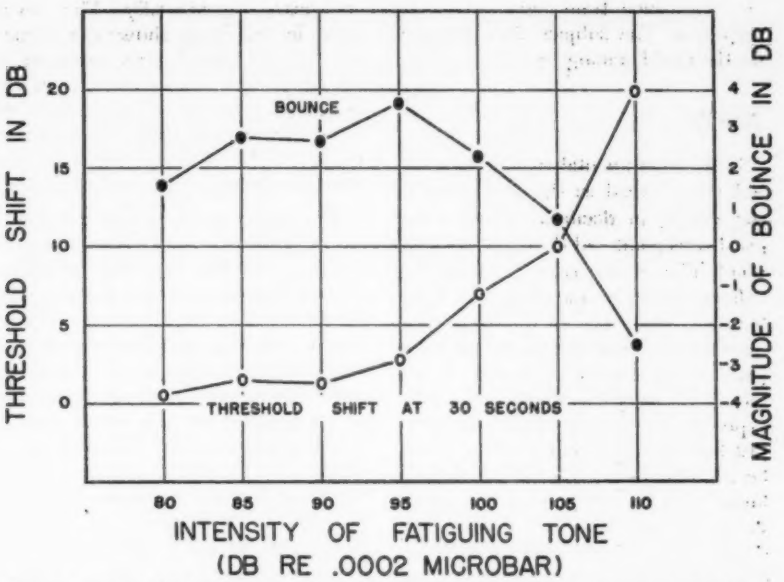

FIGURE 2. Threshold shift at 30 seconds and magnitude of bounce as functions of fatiguing intensity.

tones, thus executing a continuous tracing of his threshold over time. The attenuator was continuously variable through a range of 70 db. Attenuation changed at the rate of 1 db per second.

An audio-oscillator generated the 3000-cps fatiguing tone. The output of the oscillator passed through an attenuator, then to the normally open contacts of the relay. In order to turn on the fatiguing tone in the earphone, the experimenter activated a mechanical interval timer which closed the relay coil circuit for two minutes.

Eight young adults served as subjects. All had had from four to six hours of previous practice in this kind of threshold tracing procedure, both before and after intense stimulation. Subjects were tested in seven experimental sessions. All conditions were constant over the seven sessions except the intensity of the 3000-cps fatiguing tone. This was set to a level of either 80, 85, 90, 95, 100, 105 or 110 db (sound pressure level developed in NBS No. 9A coupler). The order in which these seven intensities were presented over the seven sessions was randomized for each subject. For a single subject, sessions were separated from each other by at least 24 hours.

In each test period, the subject first traced his threshold for the 4000-cps short tones for approximately two minutes. Then the experimenter activated the interval timer which simultaneously opened the short-tone circuit and closed the 3000-cps oscillator circuit to the earphone. At the end of the two-minute fatiguing period, the 3000-cps tone went off and the 4000-

cps short-tone train returned to the earphone. The subject then resumed his threshold tracing for ten minutes.

Results

In all experimental tracings, threshold was defined as the mid-point of the range, in decibels, between the just-heard point and the just-not-heard point. The pre-exposure threshold was defined as the midpoint of the range between the mean of the final three just-heard points and the final three just-not-heard points prior to the onset of the fatiguing tone. In the post-exposure portion of the tracing, all just-heard-points and all just-not-heard points were joined by straight lines. The post-exposure threshold shift at a particular point in time was then computed by determining the mid-point of the range between the just-heard and just-not-heard lines at this point in time and subtracting from it the pre-exposure threshold. Threshold shifts were computed at post-exposure times of 0.5, 1, 1.5, 2, 2.5, 3, 4, 6, 8 and 10 minutes.

Figure 1 shows the resulting mean recovery curves for each of the seven fatiguing intensities. Examination of these seven curves shows that, as the fatiguing intensity increases from 80 to 95 db, the magnitude of the secondary maximum, or bounce, at two minutes reflects a concomitant increase. But, as the fatiguing intensity is increased above 95 db, the bounce gradually decreases in size until, at 110 db, it has virtually disappeared.

It is of some interest to note that the rather sudden reversal in the behavior of the bounce occurs just above 95 db, an intensity region in which the threshold shift itself shows a sudden acceleration. Figure 2 illustrates these relationships graphically. The lower curve in this figure shows the threshold shift 30 seconds after cessation of the fatiguing tone, as a function of the fatiguing intensity. The pattern of this curve, with its sudden acceleration above 95 db, is quite similar to the previous findings of Hood (*4*).

The upper curve in figure 2 shows the magnitude of the bounce as a function of the fatiguing intensity. This bounce magnitude was computed by subtracting the threshold shift at one minute from the threshold shift at two minutes. This is, of course, a quite arbitrary index of the magnitude of the bounce, but it is meaningful in that it is proportional to the extent to which the recovery curve departs from a monotonic course in this critical region. Examination of figure 2 shows that, as the fatiguing intensity increases from 80 to 95 db, the magnitude of the bounce also increases. But, above 95 db, the sudden acceleration in the threshold shift is accompanied by a reversal in the trend previously displayed by the bounce.

The fact that these two curves show a sudden break in the same intensity region is of considerable interest in view of Hood's (*4*) belief that the break in the threshold shift curve marks a transition from fatigue of a purely physiological nature to fatigue of a pathological nature. In other words, according to Hood, below this critical intensity the threshold shift merely reflects the temporary reduction in sensitivity evoked by a stimulus within the 'physiological limit' of the ear. Above this level, however, the threshold shift reflects decreased sensitivity of a more pathological nature. Hood suggests that the term 'fatigue' be reserved for the former condition and that the latter

TABLE 1. Occurrence of bounce in individual recovery curves at each fatiguing intensity. X indicates presence of bounce, O indicates absence of bounce.

Subject	SPL of Fatiguing Tone						
	80	85	90	95	100	105	110
JK	x	x	x	x	x	x	x
IC	x	x	x	x	x	x	x
JM	x	x	x	x	x	x	x
MP	0	x	x	x	0	x	0
MB	x	x	x	x	0	0	0
LS	x	x	0	x	x	0	0
KK	x	0	x	x	x	0	0
MK	x	x	x	0	x	0	0

might be more appropriately considered as an early, or reversible, stage of actual acoustic trauma.

Ruedi (*8*) has also observed this critical intensity phenomenon. He defines the critical intensity, however, not as the break in the function relating fatiguing intensity to threshold shift, but as the fatiguing intensity just below which the threshold recovery curve is characterized by a marked narrowing of the range between the just-heard point and the just-not-heard point (the so-called difference limen at threshold). According to Ruedi, this narrowing marks the transition from physiological fatigue to pathological hearing loss. Furthermore, he found it possible to raise the critical intensity in individual subjects by administering massive doses of vitamin A before exposing them to the fatiguing stimulus.

These observations led Ruedi to suggest the possibility that physiological fatigue in the ear is associated with some chemical substance analogous to visual purple in the eye, and that the critical intensity marks the point at which acoustic stress is so great that the substance is temporarily broken down.

The upper curve of figure 2 suggests that this same critical intensity phenomenon appears in the behavior of the two-minute bounce. As long as the intensity of the fatiguing tone remains within the area defined by Hood and by Ruedi as 'physiological fatigue,' the bounce is present in the recovery curve. As this limit is exceeded, however, and 'pathological fatigue' or reversible acoustic trauma is evoked, the bounce declines and ultimately disappears from the recovery curve.

This finding suggests the tentative hypothesis that the bounce phenomenon has its origin in the processes underlying 'physiological fatigue' and disappears from the recovery curve when these processes are obscured by a fatiguing stimulus so intense that it evokes a state of 'pathological fatigue' or reversible acoustic trauma. In other words, as long as the intensity of the fatiguing stimulus is below a given individual's 'critical intensity' his threshold recovery curve will reflect only physiological fatigue and will show a bounce. When the individual's critical intensity is exceeded, however, physiological fatigue will be obscured by pathological fatigue, and the recovery curve will not show a bounce.

If this hypothesis is valid, it should be possible to demonstrate a relationship between the initial threshold shift

and the occurrence of a bounce in the individual recovery curves. In order to explore this question, each individual recovery curve was analyzed for the presence of a bounce. For each curve three differences were computed: first, the threshold shift at 1.0 minute minus the threshold shift at 1.5 minutes; second, the shift at 1.5 minutes minus the shift at 2.0 minutes; third, the shift at 2.0 minutes minus the shift at 2.5 minutes. If any one of these three differences was −1.0 db or greater, the curve was scored 'X' (bounce); otherwise it was scored '0' (no bounce). Table 1 summarizes this analysis for each subject.

An interesting pattern emerges from this table. The eight subjects can be roughly divided into two groups: first, those in whom a bounce is present at all intensity levels; second, those in whom the bounce disappears at high levels. In the first group (subjects JK, IC, JM), a bounce occurs in the recovery curve at every fatiguing intensity. The second group (subjects MP, MB, LS, KK, MK) is characterized by a predominance of bounces at intensity levels from 80 to 100 db, then a disappearance of the bounce from the recovery curve. In other words, with sporadic exceptions, all eight subjects show bounces at the 80, 85, 90 and 95 db levels. Above this level, however, three subjects maintain a bounce and five revert to monotonic recovery.

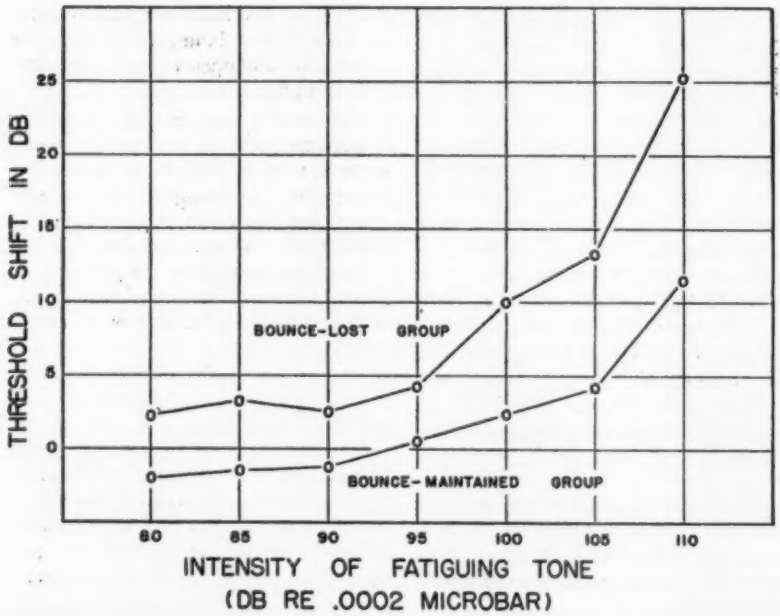

FIGURE 3. Mean threshold shift at 30 seconds for bounce-maintained group and bounce-lost group as a function of fatiguing intensity.

If the disappearance of the bounce is related to the onset of reversible trauma, it should be possible to demonstrate that these two groups of subjects differ in the amount by which the threshold is initially shifted. Figure 3 suggests that this is the case. The lower curve of figure 3 shows the mean threshold shift at 30 seconds for the first group (bounce maintained) as a function of fatiguing intensity. The upper curve shows the analogous mean shift for the second group (bounce lost). At all fatiguing intensities the threshold shift at 30 seconds is greater for this second group. These results seem to suggest a relationship between the appearance of a bounce in the recovery curve and the magnitude of the early threshold shift.

Discussion

Although the present results cannot be considered conclusive, they raise some provocative questions. Is it possible, for example, that Harris' failure to find bounces in his recovery curves can be attributed solely to the extremely high levels of his fatiguing stimuli?

Another question that has vexed workers in this area is why the recovery curves of some subjects show a bounce while the curves of others do not, when all have been exposed to the same fatiguing intensity. The present results suggest that the bounce may be, in fact, a characteristic of all recovery curves so long as the fatigue evoked is not pathological. If so, all recovery curves should show a bounce when a group of subjects is exposed to a fatiguing stimulus of relatively low intensity. But, as the intensity of the fatiguing stimulus begins to exceed the critical limit (95 db SPL in the present case), the bounce should disappear from the recovery curves of those subjects most susceptible to reversible trauma (Hood's pathological fatigue). Eventually, as the intensity is increased to still higher levels, such as those employed by Harris, even the most damage-resistant subjects should incur some temporary trauma with consequent loss of the bounce in their recovery curves. Thus it may be that, at sufficiently low intensity levels, all subjects should show a bounce, and, at sufficiently high levels, no subject should show a bounce. In the intermediate zone, however, some should and some should not.

One might further speculate that the fatiguing intensity at which the bounce does disappear from an individual's recovery curve may be related to his susceptibility to permanent, noise-induced hearing loss. If the disappearance of the bounce is related to the point at which reversible trauma over-rides true fatigue, then one might reason that the subject who maintains a bounce at high intensity levels is less susceptible to permanent damage than the subject in whom the bounce disappears at a relatively lower level. This suggests an index of noise-susceptibility independent of the threshold shift, per se.

Summary

The pattern of recovery of the auditory threshold after intense stimulation is characterized by a secondary maximum, or bounce, at approximately two minutes after cessation of the fatiguing stimulus. With a two-minute fatiguing tone at a frequency of 3000 cps and an interrupted threshold tracing signal at 4000 cps, the following relationships were observed.

As the SPL of the fatiguing tone was increased from 80 to 95 db, the mean recovery curve for eight subjects showed a gradual increase in the magnitude of the bounce concomitant with the gradual rise in the threshold shift. Above 95 db, however, a sudden acceleration in the initial threshold shift was accompanied by a gradual decrease in the magnitude of the bounce. At an SPL of 110 db the bounce had virtually disappeared from the mean recovery curve. Analysis of individual recovery curves revealed that all subjects tended to show a bounce at low fatiguing intensities (80 to 95 db). At high levels (100 to 110 db), however, the bounce was maintained in some subjects but disappeared in others. It is suggested that the disappearance of the bounce from the recovery curve may mark the transition from fatigue, per se, to reversible acoustic trauma.

Acknowledgment

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Conditioned Eyelid Response To Tone As An Objective Test Of Hearing

F. Thomas Galloway

Robert A. Butler

In many clinical situations, the audiologist cannot rely on the patient's voluntary response to tonal stimulation as an accurate indication of hearing acuity. In these cases, the tester must resort to other indices of hearing which do not depend fully on the patient's cooperation. Considerable use has been made of the conditioned galvanic skin response (GSR) as a means of objectively determining hearing thresholds. The clinical application of the GSR, however, has been hampered by lack of objectivity with respect to differentiating the responses associated with tone from chance responses. Recently, Stewart (*12*) has developed a GSR recording device which provides more precise criteria for identifying a conditioned response. By using this method of measurement, Doerfler and McClure (*3*) have demonstrated that hearing thresholds as defined by the GSR differ no more than 5 db from thresholds obtained by the standard audiometric technique.

Aside from the problem of objective measurement, there are additional problems inherent in the use of the conditioned GSR as a clinical test of hearing. Primarily, electric shock is disturbing to many people. In instances where shock follows subthreshold auditory stimuli, there may be an increase in the frequency of spontaneous GSRs which would make the test less reliable (*13*). This difficulty is, in part, alleviated by employing partial reinforcement during the acquisition of the conditioned response. Under conditions of partial reinforcement, the conditioned response is more resistant to extinction and fewer applications of the unconditioned stimulus (shock) are necessary to maintain the conditioned GSR (*8*).

Other recently investigated measures of hearing, which circumvent dependence upon the subject's voluntary response to tone, have been the EEG response to auditory stimulation (*10*) and the delayed speech feedback (*1*, *6*, *7*, *14*). Changes in brain wave (EEG) pattern associated with auditory stimulation do not provide consistent threshold measures, and, in many instances, are difficult to detect even when the auditory signal is relatively intense. The delayed speech feed-back test, in its present state of development, is not a reliable technique for estimating hearing thresh-

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olds. There is a great variability between subjects in regard to the intensity of feed-back required to consistently retard reading rate. Both the EEG response and the delayed speech feed-back test, however, are potentially valuable techniques for objectively measuring hearing.

Galambos, Rosenberg, and Glorig (*4*) utilized the eyeblink component of the startle response to loud sounds as a test of hearing. The test has proved useful at the Audiology and Speech Center at Walter Reed Army Hospital for detecting people who feign deafness in one or both ears. Hearing thresholds cannot be determined accurately on the basis of the eyeblink test because of the relatively large variability between subjects with respect to sensation levels of tones required to elicit the eyeblink (*2*). Since the eyeblink itself is amenable to precise and objective measurement, it is highly desirable to employ this response as an index of hearing. The purpose of the present study was to investigate the efficacy of the conditioned eyelid response to tonal stimuli as an objective measure of hearing.

Method

Subjects. Twenty-two subjects whose ages ranged from 19 to 52 years participated in this study. Most of the subjects demonstrated a hearing loss as measured by standard audiometric tests. All subjects were patients at the Audiology and Speech Center, Walter Reed Army Hospital.

Apparatus. Essentially, the apparatus provided a conditioned stimulus (CS), an unconditioned stimulus (US), and a means of recording the response. The apparatus used to present the CS is diagramed in Figure 1a. The CS was a pure tone generated by a General Radio Beat Frequency

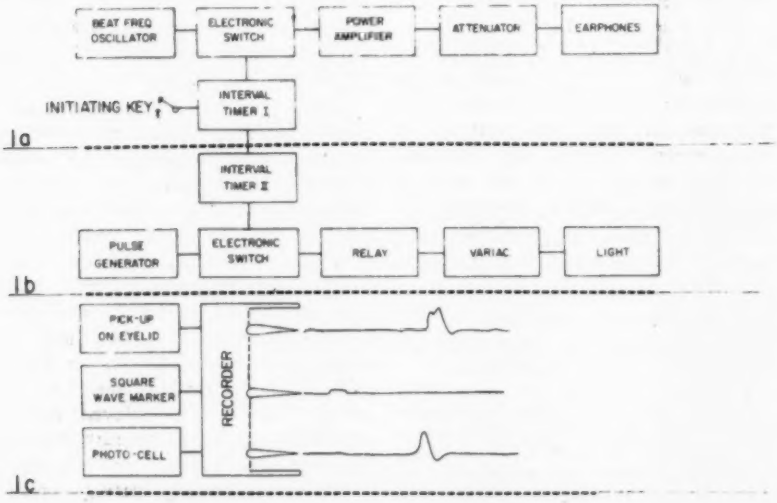

FIGURE 1. A simplified block diagram of the apparatus.

FIGURE 2. Photograph of a subject fitted with the headband and seated in front of the spotlight.

Oscillator, Model 1304-A. The signal from the oscillator was transmitted to an electronic switch (Grason-Stadler, Model 829-S8) which was controlled by an interval timer (Grason-Stadler, Model 471). The signal was then led from the electronic switch to a MacIntosh 20W2 amplifier. The power amplifier was connected to an output attenuator calibrated in steps of 1 db with a range from 0 to 110 db. A pair of Permaflux PDR-10 receivers was connected across the output attenuator.

The arrangement of the equipment which provided the unconditioned stimulus is diagramed in Figure 1b. The US was a flash of light originating from a General Electric Reflector Spot lamp rated at 150 watts. A signal from a pulse generator (Grason-Stadler, Model 876-A) was fed into an electronic switch which was controlled by an interval timer. The electronic switch was, in turn, connected to a high speed differential relay which transmitted the signal to the spot lamp. A variac was inserted between the relay and spot lamp in order to control the intensity of the light emanating from the lamp.

The eyeblink, an unconditioned response to bright light, was the response conditioned to the pure tone. To transform the mechanical energy produced by eyelid movement to electrical energy for recording purposes, a device earlier described by Galambos, et al. (*4*) was used. Briefly, this device consisted of a metal rod, one end of which was inserted into an Astatic phonograph cartridge and the other end was placed gently against the eyelid. The cartridge assembly was swivel-mounted on an otoscopic headband. The electrical potentials generated by the cartridge were amplified and recorded on a Grass

Instrument Electroencephalograph. Also recorded on the electroencephalograph was the onset of tone and the changes in illumination level produced by actuation of the light (Figure 1c). The latter was accomplished by placing a photo-electric cell directly beneath the spot lamp.

Testing Procedure. The subject was seated in a comfortable chair located in a dimly lighted sound-treated room. The headband was adjusted so that the metal rod rested lightly but securely against the right eyelid. A stand holding the spot lamp was placed approximately two feet in front of the subject. The height of the stand was raised until the spot lamp was level with the subject's eyes. Subjects were instructed to relax and look straight ahead but not directly at the spot lamp. Figure 2 is a photograph of a subject fitted with the headband and seated in front of the spot lamp.

TABLE 1. The order of presentation of frequencies for each test session.

Trial	*Frequency in cps*	*Trial*	*Frequency in cps*
1.	2000	26.	2000
2.	1000	27.	500
3.	2000	28.	4000
4.	4000	29.	500
5.	1000	30.	2000
6.	8000	31.	8000
7.	2000	32.	8000
8.	500	33.	1000
9.	1000	34.	500
10.	4000	35.	500
11.	8000	36.	8000
12.	1000	37.	1000
13.	500	38.	4000
14.	4000	39.	8000
15.	4000	40.	2000
16.	8000	41.	4000
17.	500	42.	1000
18.	2000	43.	2000
19.	500	44.	1000
20.	8000	45.	4000
21.	4000	46.	1000
22.	4000	47.	8000
23.	2000	48.	2000
24.	8000	49.	500
25.	1000	50.	500

A conditioning trial consisted of presenting a pure tone of 450 msec. duration followed immediately by a flash of light the duration of which was 70 msec. The intensity of the light necessary to elicit an eyeblink consistently was determined by previous observations and was maintained at a fixed level. Inter-trial intervals ranged from 15 to 25 seconds. Fifty eyelid conditioning trials were given daily for three consecutive days. The frequencies 500, 1000, 2000, 4000, and 8000 cps all served as conditioned stimuli. Table I shows the order of stimulus presentation for each block of 50 trials. The intensity of the tones was 20 db above the thresholds obtained by standard audiometric test procedures using the same audio equipment.

For each subject, a conditioned response (CR) was defined as an eyelid movement with a latency of 20 msec. less than the shortest latency recorded for the subject's unconditioned response to light. Response latency was defined as the time between the onset of the tone and the onset of the eyeblink. The actual measurements were made on the encephalographic paper and the distance between the pen deflection initiated by the tone and that initiated by the eyeblink was converted into msec. The recording paper was moving at a rate of 60 mm. per sec.

In order to acquire data on unconditioned response latencies, light flashes were presented in the absence of tone. More specifically, five light-only trials were given before each daily block of 50 training trials and three light-only trials were presented

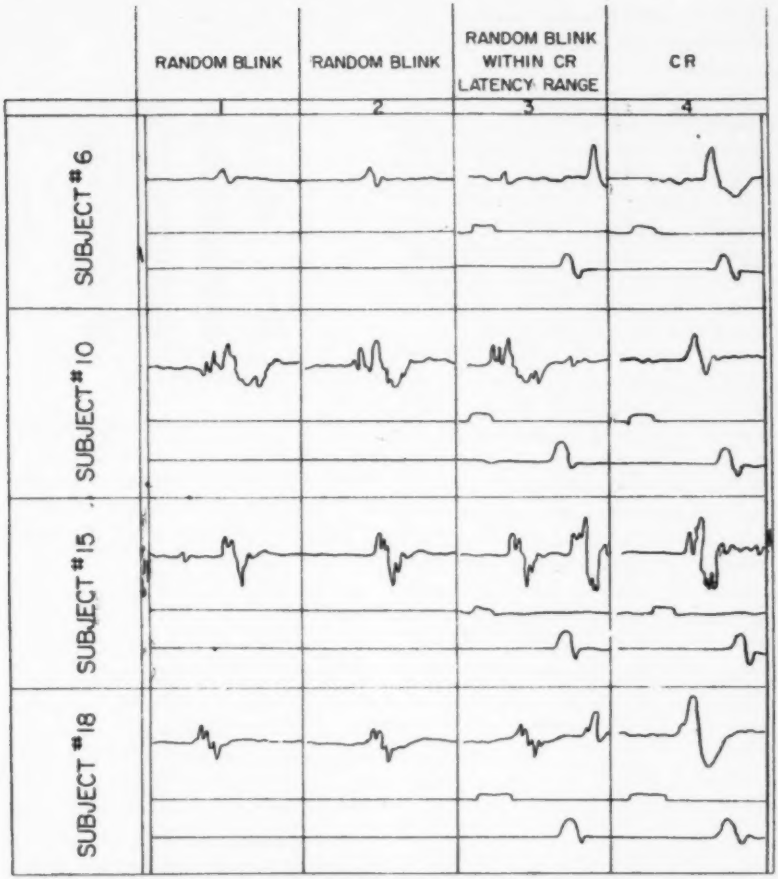

FIGURE 3. Some examples of the waveform of random blinks as contrasted to CRs.

after each block of 10 training trials. On the basis of latency measures, conditioned eyelid responses could easily be differentiated from unconditioned responses. Occasionally, spontaneous blinks occurred with latencies coinciding with those of the CR. For any one subject, however, the waveform of a spontaneous eyeblink is extremely consistent and can be rapidly distinguished from a conditioned blink.

Figure 3 illustrates examples of spontaneous and conditioned eyeblinks for four subjects. In example 3 of this figure, the latency of the spontaneous blinks occurs between the onset of tone and that of light. The waveform of the eyeblink, however, is the same as that waveform of the previous spontaneous blinks (ex-

amples 1 and 2) and is clearly different from that of the CRs shown in example 4.

On Day 4, thresholds for pure tones, as measured by the conditioned eyelid response, were obtained. For the first 10 trials, the auditory stimuli were presented at 20 db above audiometric threshold. The order of frequency presentation followed that for the first 10 trials shown in Table 1. Next, the intensity of the tone was decreased 5 db and threshold measurements were commenced. The subject was first presented with a 1000 cps tone for four trials. If two CRs occurred within the block of four test trials, the intensity of the CS was attenuated an additional 5 db and four trials were given at this new intensity level. The intensity of the CS continued to be decreased in 5 db steps until the subject failed to demonstrate at least two CRs out of four trials. *The lowest intensity of the CS to which the subject gave two CRs in four trials was defined as the threshold of hearing.* This same procedure was followed for the other frequencies. The order of presentation for the remaining tests was 2000, 4000, 8000 and 500 cps respectively.

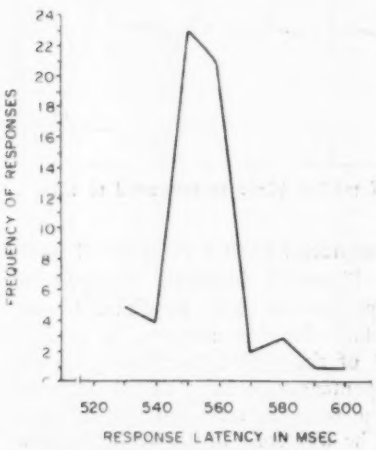

FIGURE 4. Frequency distribution of shortest light-only latencies.

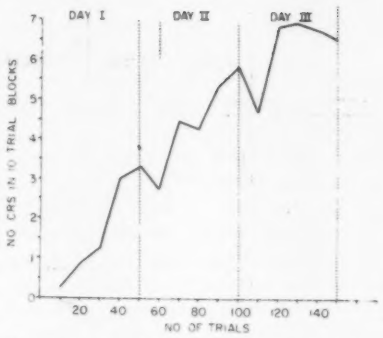

FIGURE 5. Acquisition of CRs as a function of the number of training trials.

Results

Two of the 22 subjects failed to condition within the 150 training trials and were given an additional 100 trials. Even after completion of 250 trials they exhibited no consistent CRs. The data for these subjects are not included in the results described below.

The shortest latency recorded for the unconditioned response was quite similar from individual to individual. Indeed, because of its small variability (S.D. — 14 msec.), this measure proved to be an appropriate basis for detecting the existence of a CR. Figure 4 shows the distribution of the shortest unconditioned response latencies for all subjects as measured from the time at which the CS would have been presented.

The curve shown in Figure 5 depicts the acquisition of the conditioned eyelid response and is con-

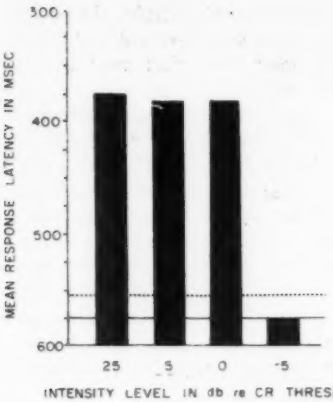

FIGURE 6. Mean response latency as a function of the intensity of the CS *re* CR threshold. The solid horizontal line represents mean response latency of light-only trials and the dashed horizontal line represents the critical response latency for establishing the presence of a CR.

sistent with typical learning curves. There is, however, a slight decrease in the frequency of the CRs for the first block of 10 trials given on Days 2 and 3 (trials 51 to 60 and 101 to 110). Although subjects received relatively prolonged training, the average number of the CRs within any block of 10 training trials never exceeded seven responses.

On Day 4, when thresholds to tones were measured by this conditioning technique, the latencies of the CRs remained stable as the intensity of the CS was decreased until an intensity level was reached at which at least two CRs out of four trials failed to occur. In the histogram shown in Figure 6, the latency of the CRs are plotted against intensity level of the CS. Each bar of this histogram is not based on the same total number of the CRs, because subjects differed from one another with respect to the point at which they ceased showing CRs. Nevertheless, the data suggest that the CR latencies remain stable at auditory intensities near threshold.

Table 2 compares the thresholds obtained by standard audiometric tests with those measured by the conditioned eyelid technique. In most cases, those thresholds obtained by the standard method were slightly lower. The mean deviation of the CR thresholds from the standard audiometric thresholds was 4.95 db.

Discussion

These data demonstrate the conditioned eyelid response can be used as an objective test of hearing. Probably the chief virtue of this testing technique is the precision with which the conditioned eyelid response can be defined. Furthermore, the unconditioned stimulus is in no way noxious

TABLE 2. Comparison between thresholds obtained by standard audiometric procedures and and those obtained by the conditioning technique (CR). A minus sign indicates that the threshold obtained by the CR technique was lower than that found by standard audiometric measures by the amount indicated.

Subject	*Test Frequency in cps*				
	500	*1000*	*2000*	*4000*	*8000*
1	0	5	5	0	20
2	5	0	0	5	5
3	5	5	5	5	5
4	5	5	0	5	5
5	5	5	10	5	15
6	5	0	5	0	5
7	5	0	5	5	5
8	5	5	5	0	5
9	5	5	15	10	5
10	10	5	10	5	5
11	5	0	5	10	–5
12	5	0	0	5	0
13	5	0	5	0	5
14	20	5	5	10	5
15	5	–10	0	0	NR
16	10	5	5	0	0
17	5	5	5	5	0
18	5	–20	–15	0	0
19	5	5	5	0	5
20	5	5	5	5	0

to the subject. The main disadvantage in using this conditioning technique is the prolonged training usually required to establish the CR. Indeed, not all subjects can be conditioned within the number of training trials presented in this study. One of the two subjects who failed to condition was extremely uncooperative and frequently closed his eyes, which made it impossible to elicit a blink. On the other hand, several subjects demonstrated relatively consistent CRs early in the training sessions. Previous studies have indicated that attitudinal factors have a strong influence on the rate of conditioning (*5, 9, 11*).

Most of the thresholds obtained by the conditioning technique were higher than those measured audiometrically. This discrepancy might be attributed to the fact that during the conditioning procedure, the subjects were not requested to listen for a tone but only to relax and look ahead. It is apparent that actual threshold intensities are not responded to unless the subject is attending to the task of listening. In those few cases where the audiometric thresholds were higher than those obtained by the CR technique, it is assumed that the original audiometric thresholds were in error. This assumption is substantiated by the data reported by Wilcott (*15*) who found that CRs to subthreshold auditory stimuli could not be established.

In a clinical situation, the number of training trials could, of course, be varied depending on the rate at which individuals condition. Moreover, the response latencies would not have to be measured for each training trial. For example, a record of the response latency for every fifth trial should be sufficient to show whether the CR is being established. Finally, the equipment necessary to give the test could be simplified over that used in the present study.

It is suggested that the conditioned eyelid response to pure tones can be used effectively as an objective measure of hearing in cases where the thresholds obtained by successive standard audiometric tests are inconsistent with one another. The conditioned eyelid response might also serve as a useful test in detecting malingers; however, attitudinal factors would probably retard rate of conditioning.

Summary

The conditioned eyelid response to tone was used as an index of hearing acuity. The data for 20 subjects showed that the difference between thresholds obtained by audiometric tests and those measured by this conditioning technique averaged approximately 5 db. It is suggested that the conditioned eyelid response, chiefly because of its amenability to precise measurement, might serve as a useful objective measure of hearing.

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Masking Of Impaired Ears By Noise

Charles Lightfoot
Raymond Carhart
John H. Gaeth

Since Willis observed paracusis some 275 years ago, various studies and clinical observations have been made on the performance of impaired ears in noise. During recent years a number of European otologists have experimented with noise audiometry as a possible diagnostic tool. Unfortunately, these experiments, which have been reviewed by Palva, Goodman, and Hirsh (*6*), provided results rather lacking in agreement.

There are also discrepancies among results of the few studies which have been done in this country on the masking effects of thermal noise on impaired ears. Webster, Lichtenstein, and Gales (*10*), after analyzing the San Diego Fair thresholds, concluded that, in using the performance of normals to predict noise-masked pure-tone thresholds of deafened persons, not only degree but also type of hearing loss must be taken into account. Tonndorf (7), who used both speech and pure-tone stimuli, also found abnormal relationships between shift in threshold of hard-of-hearing listeners and level of masking noise. On the other hand, Palva and his associates reported that the pure-tone thresholds they obtained for a number of impaired ears masked by thermal noise of 100 db (re 0.0002 microbar) were—despite the variety in type of hearing loss—about the same as thresholds of normal ears masked by the same level of noise; they concluded, therefore, that the masked threshold is not a useful indicator for differential diagnosis.

The study reported here was intended to explore further—with both pure-tone and speech stimuli—the masking effects of white noise on ears with different types and degrees of hearing loss. Discussion of various relationships pertinent to the study will be facilitated by the use of the following conventional designations:

SPL = sound pressure level in db above 0.0002 microbar.

β_o = SPL of threshold in quiet.

β_m = SPL of threshold in noise. When the subscribed m

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is replaced by a number, the latter designates the overall SPL of noise.

M = masking = $\beta_m - \beta_o$.

B = SPL of noise in a band one cycle wide.

K = $\beta_m - B$ (for a normal ear when $M > 20$ db). K was introduced by Fletcher and Munson (*3*) to specify 'width of a critical band,' *i.e.*, a band of frequency components in distributed noise which contribute to the masking of a tone in the center of the band.

Z = $B + K - \beta_o$. Z is commonly referred to as the 'effective level' of masking noise and is sometimes interpreted as the sensation level of a critical band of noise.

The hypothesis evaluated was that a noise with a flat spectrum will produce the same amount of masking (M) in an ear which is impaired—whether conductively or perceptively—as it will produce in an undamaged ear provided that the intensity of the noise is varied so that its effective level (Z) is the same for the two ears. According to this hypothesis, a 95-db noise would elevate the monaural threshold of a person with a 35-db hearing loss as much as a 60-db noise would shift the threshold of a normally hearing person. It would follow that masked thresholds obtained for a number of hypacusic groups, each of which represented a different degree of hearing loss in quiet, would provide data from which M could be plotted as a function of Z even though only one or two intensities of noise were used. The function so obtained, moreover, would coincide with the M-Z function found by such investigators as Hawkins and Stevens (*5*), who obtained for each of a number of noise intensities the masked thresholds of a single group of normal listeners.

Procedure

Subjects. Although various investigators who have studied the effects of broad-band noise upon normal auditory threshold have provided results which are in close agreement, it was decided to use 31 otologically normal university students—12 men and 19 women—as control subjects. The majority of them were 21 years old, and none was older than 29.

A request to serve as an experimental subject was directed to each of some 200 hard-of-hearing persons who were selected after a careful survey of the records on all persons examined in the Northwestern University Hearing Clinic during the two-year period prior to the time experimentation began. The selection of possible subjects, although governed by considerations of expediency, was guided by a desire to obtain a good coverage of clinical types with each individual a clear-cut example of his type. About 40 per cent of the hard-of-hearing persons who were asked agreed to be tested. Although complete sets of data were obtained for all volunteers, about 20 proved to have a mixture of conductive and perceptive impairments or a retro-cochlear involvement. In order to keep the issues clear and to simplify presentation of the results, we shall regard as experimental subjects only the 59 hard-of-hearing persons whose impairment in each case was almost entirely limited to the conductive mechanism or was almost entirely limited to the perceptive mechanism.

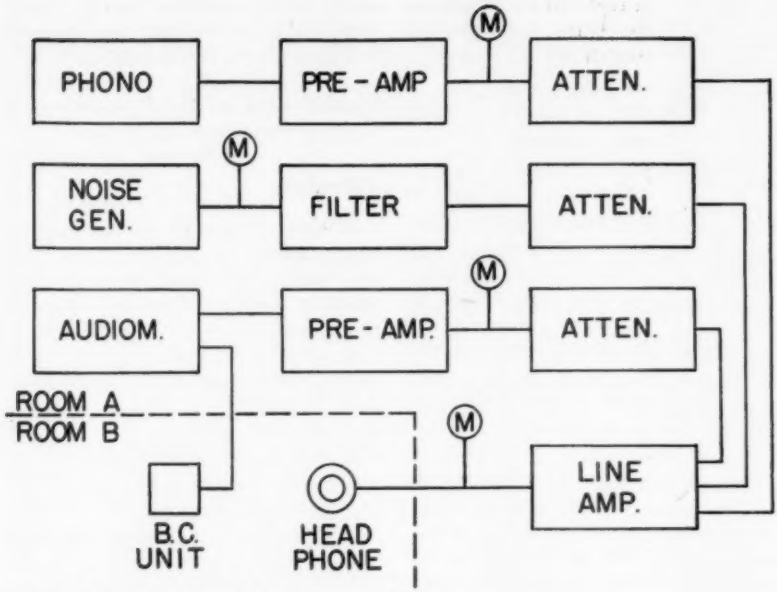

FIGURE 1. Diagram of threshold testing assembly.

There were 17 (10 men and 7 women) in the conductive group and 42 (20 men and 22 women) in the perceptive. The ages in each of these groups, compared to the controls, averaged considerably higher and covered a much wider range (conductives: $\overline{X} = 36$, $R = 38$; perceptives: $\overline{X} = 46$, $R = 53$). According to the examining otologist, the conductive group included nine cases of otosclerosis, five of otitis media, and three of adhesive otitis. The perceptive group included eight cases of presbyacusis, seven of post-toxic deafness, eight of stimulation deafness, two of endolymphatic hydrops, and 17 of multiple or questionable etiology.

Equipment. A standard clinical audiometer and W-2 phonograph records of spondaic words (*1*) provided the stimuli as shown by Figure 1. The output of a thermal noise generator could be mixed with either type of signal. Amplifiers and attenuators were placed in the circuit to allow independent control of signal and noise level. All signals were transduced by a PDR-10 earphone set in a MX1-41AR cushion. The earphone, placed in a headband opposite a dummy earphone, was worn by the subject seated in a chamber having an ambient noise of less than 24 db on the A scale of a sound level meter. Also in the test chamber was a signal-light switch and talk-back microphone which enabled the subject to respond to the test stimuli. The rest of the equipment was located in an adjacent room with the tester.

The essentially flat output of the

TABLE 1. Level-per-cycle (B) of 80-db thermal noise as determined from 6-cc-coupler measurements of earphone output.

Frequency in cps	*B*	*Frequency in cps*	*B*
100	33.7 db	3,000	41.1 db
125	35.2	4,000	37.4
250	39.0	6,000	40.6
500	39.4	8,000	35.4
1,000	40.1	9,000	32.4
2,000	40.2	10,000	<20.0

thermal noise generator was modified by a 100-cps high-pass filter and by the response of the earphone. Spectral measurements of the noise, which were made in the manner described by Hawkins and Stevens (*5*), are presented in Table 1.

Testing Procedure. The first of the two experimental sessions required of each subject began with the obtaining —by standard 5-db-step audiometry— pure-tone AC and BC thresholds for both ears. The subject was then examined by an otologist who had the audiometric results and previously obtained clinical data before him. In the case of a hard-of-hearing subject who typically displayed bilateral impairment, the results of the otological examination were used as bases for deciding which ear would be tested further, for it was believed that only one ear per subject should contribute to the experimental data. The ear with the purer type of impairment was always selected as the experimental ear; otherwise, the ear with the lower degree of loss was chosen. When the experimental ear was decided upon, an unmasked spondee threshold was determined for it according to the instructions provided with the W-2 records.

During the second session, which generally followed the first by a week or two, two additional sets of pure-tone and spondee thresholds were obtained for each subject, each set in a different level of noise. The two noise levels for all of the controls and for

TABLE 2. Means and standard deviations of pure-tone thresholds, in db re 0.0002 microbar, exhibited by 31 normal ears.*

Frequency in cps	*Quiet*		*60-db noise*		*80-db noise*	
	$\bar{X}$	*SD*	$\bar{X}$	*SD*	$\bar{X}$	*SD*
125	49	4.4	51	5.9	59	3.4
250	30	2.8	42	4.2	59	4.2
500	16	4.1	38	3.6	57	4.2
1000	12	3.6	39	4.3	59	4.2
2000	14	4.8	42	2.7	61	3.6
3000	13	4.5	44	3.6	65	4.5
4000	13	3.7	40	3.4	60	5.1
6000	21	6.7	46	3.5	66	4.8
8000	22	5.2	46	3.4	66	4.6

*All SPL values in this and in subsequent tables are based upon 6-cc-coupler measurements.

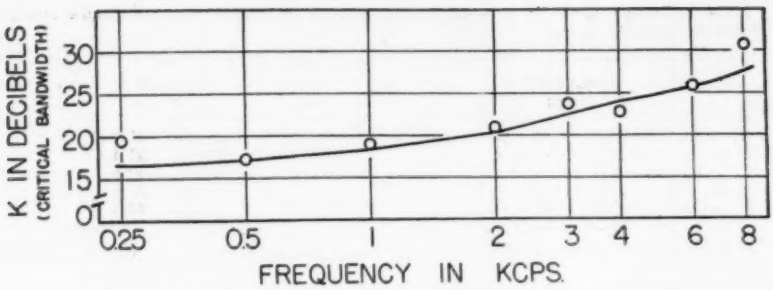

FIGURE 2. K as a function of frequency. Each circle represents the difference between the mean threshold level of 31 control subjects for a tone mixed with 80-db noise and the spectral level of such noise at the frequency of the tone. The line represents the mean of K functions obtained at the Bell Telephone Laboratory (*4*) and at the Harvard Psycho-Acoustic Laboratory (*5*).

the first 27 of the hard-of-hearing, including eight conductive and 19 perceptive and referred to as Group 1, were 60 and 80 db (overall SPL). For the remainder of the hard-of-hearing (Group 2: nine conductive and 23 perceptive), the levels were 80 and 95 db.

Pure-Tone Thresholds

Control Subjects. The several distributions of pure-tone thresholds obtained for the control subjects are summarized by the data in Table 2. More pertinent to consider here is the typicalness of the masking displayed by the controls. In order to see how they compared at various frequencies with other groups in this respect, K values were determined by subtracting the spectral levels of noise listed in Table 1 from the corresponding masked threshold averages listed in the third column of Table 2. Figure 2 shows how close are such determinations to the mean of the K functions obtained by French and Steinberg (*4*) and Hawkins and Stevens (*5*). No value is shown for 125 cps; the masking at that frequency was less than the minimum amount required for a proper determination of K.

The β_{60} data of the controls were used to evaluate further the masking effects of the 80-db noise on the group. For each frequency for which a K value was computed, the effective level (Z) of the 60-db noise was determined from $Z = B + K - \beta_o$, in which B is assigned a value of 20 less than that listed in Table 1, K is the amount shown by Figure 2, and B_o is taken from the first column of means in Table 2. The relationships of each Z so obtained to the average masking created by the 60-db noise is shown in Figure 3. The obtained relationships are very close to what the idealized function of Hawkins and Stevens would predict. The largest deviation, amounting to less than 2.5 db, is at 250 cps. This is not altogether surprising in view of the fact that Hawkins and Stevens found, for a comparable Z value, a similar discrepancy at 350 cps, the lowest frequency for which they reported data.

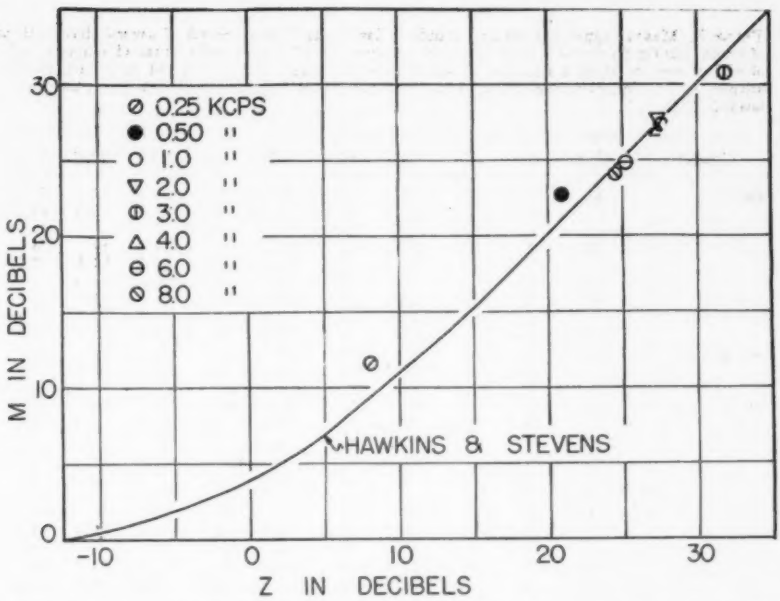

FIGURE 3. Masking (M) of pure-tone threshold as a function of effective level (Z) of noise. The symbols show the masking averages found for the controls when the overall SPL of noise was 60 db. Z values of the noise were derived from the 80-db noise data as follows: $Z_{60} = B_{80} + K - \beta_o = M_{80} - 20$.

To summarize the results provided by the normally hearing group, it may be said that their thresholds, both masked and in quiet, were about what might have been predicted on the basis of previous studies. It seems justifiable to conclude, therefore, that there was nothing in the procedure which should cause a hard-of-hearing subject—if the hypothesis under scrutiny were valid—to display appreciably more or less masking than is indicated by the Hawkins and Stevens function for whatever might be the effective level of the masking noise.

Hard-of-Hearing Subjects. Threshold data obtained for the hard-of-hearing subjects are summarized in Tables 3 and 4. The 60-db noise had little effect on the threshold averages of either the conductive or the perceptive loss groups. With higher noise intensities, however, the averages became appreciably larger and the standard deviations were smaller. Comparison of Table 2 with Tables 3 and 4 confirms the observation of Palva and his colleagues (*6*) that a number of increments in noise intensity tend to make a group of hard-of-hearing persons approach, in a general way, the characteristics of a normally hearing group with respect to both average masked threshold and variation among individual masked thresholds.

In order to have a better basis for evaluating the initial hypothesis than

TABLE 3. Means (upper figures) and standard deviations (lower figures) of several distributions of thresholds (in db above 0.0002 microbar) obtained for 17 conductively impaired subjects, eight of whom were in Group 1 and nine of whom were in Group 2. Data provided by pure-tone tests are headed by numbers corresponding to the tonal frequencies (in cps). Speech data are in the column headed W-2.

Condition	*Group*	*250*	*500*	*1000*	*2000*	*3000*	*4000*	*6000*	*8000*	*W-2*
Quiet	#1	72	58	53	46	48	48	61	60	70
		10.7	13.4	11.2	18.0	14.7	12.6	19.5	22.6	11.5
	#2	77	65	57	52	52	52	62	59	73
		7.2	9.6	9.9	17.8	15.1	17.0	14.3	18.1	7.7
	All	75	61	55	49	50	50	61	60	71
		9.2	12.0	10.8	18.2	15.1	15.2	17.0	20.3	9.8
60-db noise	#1	72	62	55	51	53	55	65	65	73
		10.4	12 5	11.3	14.5	10.8	11.6	17.7	17.3	9.2
80-db noise	#1	77	66	64	64	66	68	72	73	78
		12.0	11.7	4.8	3.5	3.5	6.0	12.7	15.5	5.9
	#2	78	67	62	67	72	69	70	70	79
		5.7	7.1	7.7	5.7	6.3	5.5	7.8	15.1	5.1
	All	77	67	63	65	69	69	71	71	79
		9.2	9.6	6.7	5.0	5.8	5.8	10.4	15.3	5.5
95-db noise	#2	79	72	71	79	88	84	85	82	88
		5.3	7.8	6.8	4.7	3.1	2.8	4.8	8.7	4.2

is provided by group statistics such as those in Table 3, three quantities were determined for each of the two masked thresholds provided by each hypacusic subject for each frequency: (1) the amount of masking (M); (2) the effective level of the masking noise (Z) based upon the K value derived from the mean threshold obtained for the controls when masked by the 80-db noise; (3) the masking discrepancy. This latter amount was obtained by subtracting from M the masking expected (M_E), on the basis of the Hawkins and Stevens function, for whatever Z value the noise might have had. If, for example, a tone was just-audible to a subject in quiet were mixed with noise of Z = 20, the tone might have to be increased in level by 20 db before it again reached the subject's threshold. In such a case, the masking discrepancy ($M - M_E$) would be zero for, as may be seen in Figure 3, 20 db of masking is normal when the Z level of masking noise is 20. If, the circumstances just described were the same in all respects save that the masking noise elevated the subject's threshold by 30 db instead of 20, the discrepancy would be 10 db.

Individual masking discrepancies were categorized according to frequency of test tone, type of impairment, and general Z level of noise. Thus, for a given frequency, there were formed several discrepancy distributions, one of which represented a number of subjects having the same type of impairment who were tested in noise with a Z of −13 or lower, another of which represented a number of subjects having the same type of impairment who were tested in

TABLE 4. Means (upper figures) and standard deviations (lower figures) of several distributions of thresholds (in db above 0.0002 microbar) obtained for 42 perceptively impaired subjects. Group 1: N = 19. Group 2: $21 \geq N \leq 23$. Column designations are like those of Table 3.

Condition	*Group*	*250*	*500*	*1000*	*2000*	*3000*	*4000*	*6000*	*8000*	*W-2*
Quiet	#1	60	50	58	66	71	78	82	78	65
		22.0	15.2	16.9	16.5	15.5	13.8	21.5	22.4	13.5
	#2	56	50	54	68	69	71	85	83	70
		17.9	17.9	14.0	13.4	14.4	17.3	23.1	24.9	15.0
	All	58	50	56	67	70	74	83	78	68
		16.0	16.7	15.4	14.7	14.9	16.3	22.4	26.4	14.4
60-db noise	#1	63	54	61	67	72	79	85	80	71
		10.4	9.6	12.0	14.0	18.8	16.4	22.5	25.2	12.4
80-db noise	#1	68	61	67	72	78	82	86	82	79
		8.4	5.5	8.6	9.4	10.9	13.3	21.2	24.3	7.6
	#2	60	58	63	74	82	81	89	89	76
		14.0	11.4	9.1	7.7	8.3	10.6	14.5	20.3	9.9
	All	64	59	65	73	80	82	88	83	77
		12.4	9.4	9.1	8.4	9.8	11.9	18.1	25.8	9.0
95-db noise	#2	67	67	75	86	95	93	101	100	87
		8.8	7.9	6.9	5.6	5.2	6.6	11.6	17.9	6.4

noise with a Z between −12 and 0 inclusive, *etc.*[1] Discrepancies derived from the control thresholds for the 60-db-noise condition were treated in the same manner as were the discrepancies of the hypacusic subjects. The median value of each discrepancy distribution which represented no fewer than four subjects was determined.

Median masking discrepancy as a function of frequency is shown for each of the several groups of data by the charts in Figure 4. The main relationships displayed by the figure may be summarized as follows: (1) When the effective level of noise was so low that no masking would be expected on the basis of the Hawkins and Stevens function ($Z \leq -13$), neither group of hard-of-hearing subjects departed appreciably from expectancy at any of the tested frequencies except 4000 cps, at which frequency the few conductives for whom such low Zs were obtained displayed upward shifts in threshold. (2) When the effective level was somewhat higher, but not so high that more than 5 db of masking would normally be expected, most of the perceptives tended to be unduly masked at 4000 and 6000 cps and most of the conductives showed similar abnormality at 8000 cps. (3) When the effective level was still higher, but not so high that Z would normally be equal to M, many perceptives were

[1] If a subject had either a very mild loss or a very severe loss, the Z levels of the two noise intensities in which he was tested might fall in the same range. For example, one Z might be −40 and the other might be −20. Since all Zs of −13 or lower were relegated to the same range, such a subject was assigned a single discrepancy value equal to the mean of the two obtained values.

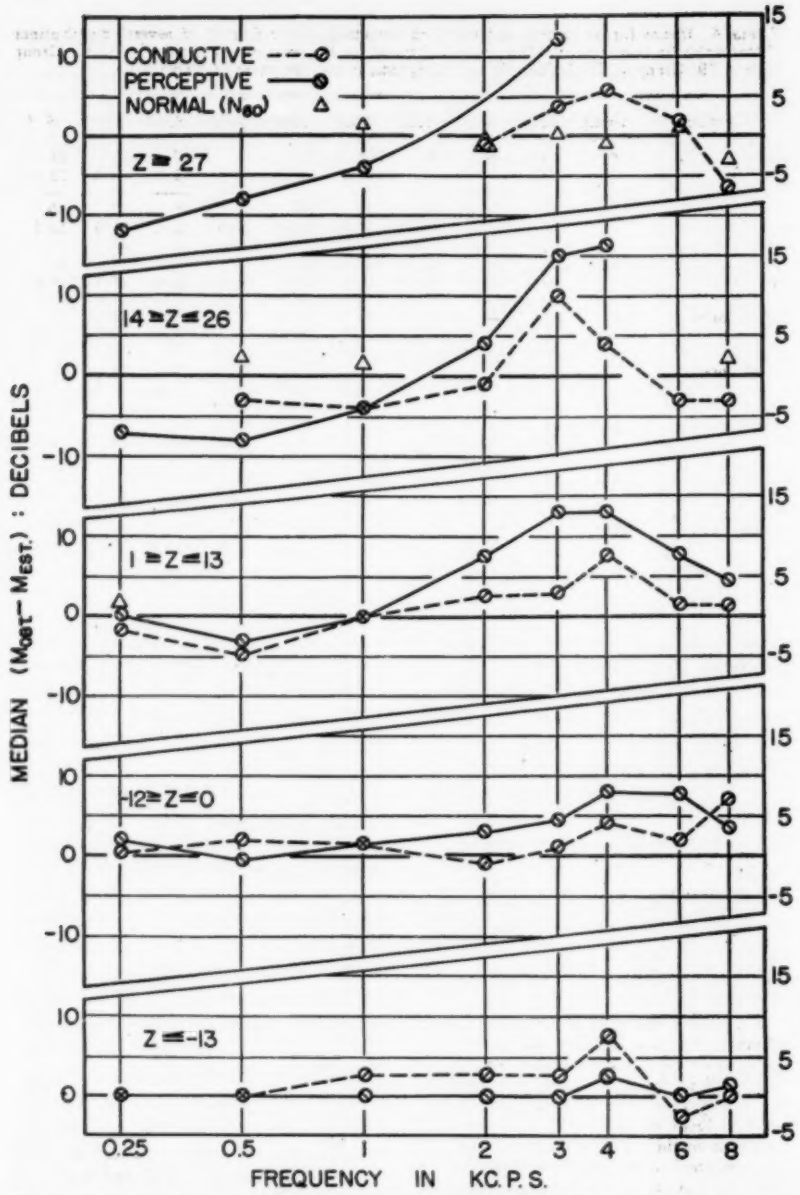

FIGURE 4. Median discrepancy between the masking obtained and that estimated from the normal M-Z function of Hawkins and Stevens (5) plotted as a function of frequency for various types of subject and various levels of Z.

masked considerably more at frequencies from 2000 through 6000 cps than the experimental hypothesis would predict; such abnormality was most marked at 3000 and 4000 cps. (4) When the effective level became large enough so that it normally would equal M, the masking displayed by a majority of perceptives exceeded the Z value of the noise by from 10 to 20 db at 3000 and 4000 cps. (5) The same subjects displayed abnormally little masking at 8000 and 1000 cps; while at 250 and 500 cps there was even less masking. (6) The masking abnormalities of the perceptive-loss group were roughly paralleled, with respect to their relationship to frequency, by abnormalities of the conductives; the latter, however, were less pronounced than the former. (7) Masking displayed by the controls when tested in 60-db noise was close to expectancy regardless of frequency; however, control data were available for but one or two ranges of Z at each frequency.

Not apparent from Figure 4 is the fact that there was considerable inter-subject variability in discrepancy between obtained masking and estimated. It was not uncommon for two subjects who had the same threshold in quiet and the same type of hearing loss to differ with respect to masked threshold by 10 or 15 db even though the intensity of the masking noise was the same in both cases. By and large, the various discrepancy values obtained for a given range of Z and type of loss appeared to be normally distributed about the mean discrepancy. The trends of such means would closely resemble those of the medians displayed in Figure 4. The several etiological sub-groups within either of the two main categories of hard-of-hearing subjects were not represented by large enough numbers to allow adequate comparison of sub-group trends. What data are available, however, suggest that etiological factors were importantly related to masking only in so far as they influenced type and degree of loss.

Speech Thresholds

Control Subjects. The mean spondee threshold of the 31 normally hearing subjects when tested in quiet was 28.5 db (SPL), which is several db higher than the norm proposed by the developers of the W-2 test (*1*). The mean masked threshold obtained with the 60-db noise was 53.9 db, while that obtained with the 80-db noise was 73.6 db. As might be expected from earlier work (*5*, *9*), each of these means is between 14 and 15 db larger than that representing the average threshold for tones of 500, 1000, and 2000 cps under the same masking-noise condition. The spondee thresholds, when plotted as a function of noise level, form a pattern which parallels the curve presented by Hawkins and Stevens (*5*) to describe normal threshold of intelligibility for connected discourse; there is less resemblance to the curve they presented to describe threshold of detectability. The standard deviation of the word thresholds was 4.20 db for quiet, 3.47 for 60-db noise, and 3.12 for 80-db noise. These amounts suggest that introduction of masking noise or increments in its level may be conducive to reducing individual differences in threshold for words. A similar progressive reduction in inter-subject variability was not found in the pure-tone data, possibly because the latter were obtained by means of 5-db step audiometry.

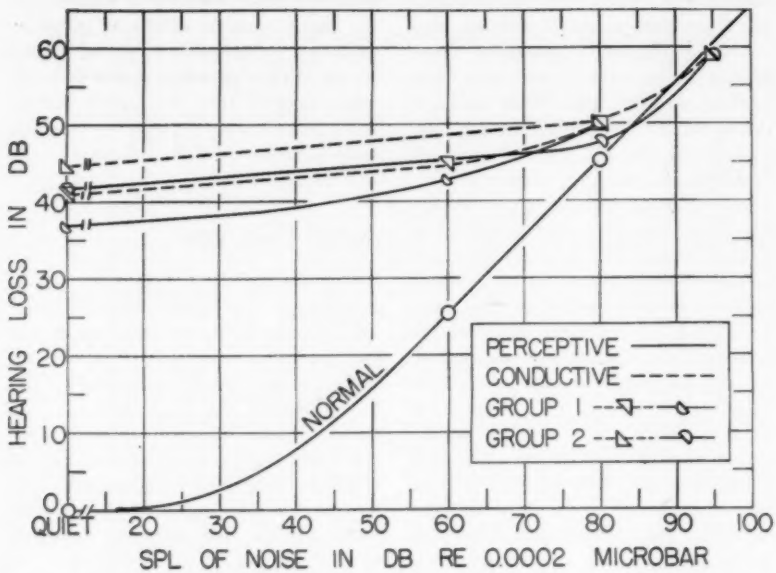

FIGURE 5. Mean spondee threshold, in db above the threshold of the average control subject in quiet, as a function of the overall level of masking noise.

Although not directly pertinent to the purpose of this paper, an estimate of the normal critical band width for spondees may be of interest. Using the mean threshold of the controls masked by the 80-db noise as the first term in the right side of the equation $K = \beta_m - B$ and the average of the spectral levels listed in Table 1 for 500, 1000, and 2000 cps as the second term provides an estimate of 33.75 db. The estimate based upon the 60-db noise data is a fraction of a db greater. Substituting the mean of the two estimates for the left side of the equation K(db) = 10 log K(cps) provides a value of 2440 cps. No comparable estimate has been found in the literature.

Hard-of-Hearing Subjects. Figure 5 shows, for each subject category, mean spondee threshold as a function of masking noise level. Hard-of-hearing Group 1, for whom noise levels of 60 and 80 db were used, had a better quiet threshold average than did Group 2, for whom noise levels of 80 and 95 db were used. The conductively impaired subjects of both groups showed, collectively, less initial loss than did subjects perceptively impaired. Introducing noise and increasing its intensity resulted not only in progressively higher threshold averages but also in progressively smaller variation due to group differences and variation due to difference in type of impairment. Threshold averages obtained for the four sub-groups of hypacusics in 80-db noise were about equal; moreover, none was more than a few decibels higher than the control average obtained for the same inten-

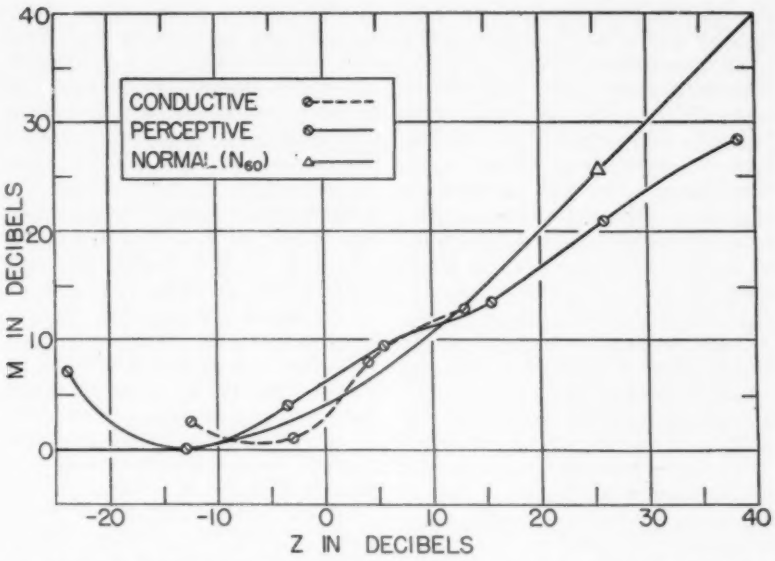

FIGURE 6. Median masking (M) of spondee threshold as a function of median effective level (Z) of masking noise for various types of subject. The function passing through the M-Z relationship obtained for the control subjects is that of Hawkins and Stevens (5).

sity of noise. The threshold averages obtained for the conductives and perceptives in 95-db noise were virtually the same, and both averages were very close to what would be expected for the control subjects had they been tested in noise of the same intensity. Evidently the previously mentioned ability of masking noise to diminish differences between normal and impaired ears with respect to tone thresholds also applies to word threshold.

In addition to diminishing variation among central tendencies of the several sub-groups, increasing the intensity of masking noise reduced inter-subject variability within each sub-group of hard-of-hearing. (See standard deviations in the last column of Table 3.) By and large, inter- and intra-group relationships displayed by the spondee data bore a resemblance to those displayed by the pure-tone data.

Masking was determined for each hypacusic spondee threshold obtained in noise, regardless of the latter's intensity, and for each control threshold obtained in 60-db noise. The Z level of the masking noise in each case was computed from the conventional formula, for which the value of K was taken as 34 db. Ms were then categorized according to value of Z and type of hearing loss. The median Z and median M of each of the distributions, except those in which fewer than four subjects were represented, are presented in Figure 6 along with the normal M−Z function. Although the latter function passes directly

through the triangular symbol which specifies the median M of the controls, it diverges considerably from medians of various distributions representing impaired ears. Especially evident in Figure 3 are abnormal M−Z relationships of perceptively impaired ears. One example of such abnormality originated from the fact that a majority of the perceptive-loss subjects who were tested in noise for which the Z value was −20 or lower unexpectedly displayed substantial shifts in threshold. The resemblance of such anomalous masking to certain effects on which Doerfler and Stewart's test (2) is based suggests that mechanisms not solely auditory may have contributed. Little can be said with respect to the role of impairment type on M when Z is −20 or below because only three conductive-loss subjects were tested in noise of such low Z value. Most of the hard-of-hearing—of either type—who were tested in noise which ranged in Z from −20 to 20 were masked to about the extent that the initial hypothesis would predict. When Z levels were higher than 20, noise was less effective in masking perceptive-loss subjects than in masking normally hearing subjects; no conductive-loss subjects were tested in noise of comparable Z levels.

Analysis of the complex relationship between speech threshold and pure-tone audiogram of impaired ears does not fall within the scope of this paper; however, a few observations may be in order. Although, in the case of the hypacusic subjects, the masking of words was generally somewhat similar to the masking of tones in the range from 500 to 2000 cps, there was not the close relationship which was found for normally hearing subjects. The three-tone-average masking of the typical perceptive-loss subject who was exposed to noise of a Z level higher than 20 was 3 or 4 db less than his speech masking. In contrast, the two-tone average, which discounted the threshold at whichever of the three frequencies the subject had the greatest hearing loss in quiet, was a few decibels greater than his speech masking. When the Z level was between one and 20, the two-tone-average masking was generally a little closer to the speech masking than was the three-tone-average. When Z was negative, there was generally little difference between the two-tone and three-tone average; however an estimate of speech masking based upon the normal M-Z function would be about as accurate as an estimate based upon the masked audiogram. There appeared to be no pure-tone counterpart of the unpredicted masking of speech displayed by the perceptives who were tested in Z levels of −20 or below.

Discussion

At the outset is was hypothesized that the relationship between masking and Z is a general one, applicable to various types of hearing loss and to various kinds of signal. Since Z was defined in terms of normal K, the abnormal M-Z relationships which were obtained may be regarded as indicative of circumstances under which the critical-band concept of Fletcher and his colleagues may have limited application.

If it is assumed—as did those who formulated the critical-band hypothesis—that, for a particular type of signal, the band of noise which is solely responsible for masking contains the same frequency components regardless

of the characteristics of the ear, then the results suggest that the masking effectiveness of the band varies with different types and amounts of hearing loss and the direction of such variation is influenced by characteristics of the masked signal. It is difficult to see, nevertheless, why the band of noise which would effect the masking of a 3000-cps tone, for example, should not be as effective in the case of a normal ear as in the case of one with a conductive loss when the level of the noise band relative to threshold level in quiet is the same in both cases. Possibly there are factors which interfere with the measurement of a conductive loss at certain frequencies.

Another way of interpreting the abnormal M-Z relationships might be as indications of abnormal critical band widths. In other words, it might be said that the band of noise which is responsible for the masking of an impaired ear may not encompass the same number of frequency components as the band which would be responsible for the masking of a normal ear. According to this point of view, each median in the uppermost chart of Figure 4 could be regarded as representing distribution differences between abnormal K values and the K taken as normal in the study. The chart second uppermost in the same figure could be regarded as a comparable representation. Then it might be concluded that, while direction of K digression is related to frequency of the test signal, the amount of such digression is related to type of impairment and possibly to sensation level of noise. Possibly it would be legitimate to suggest that the band of noise which contributed to the masking of a 250-cps tone was only a dozen or so cycles in width in the case of many of the perceptively impaired subjects; whereas, in the case of the average control subject, the comparable band width was 90 cps. In contrast, at 3000 cps a band 240 cps in width contributed to the masking of the average control; while in the case of many impaired ears of both types the band masking that frequency was as wide as that which masked normal spondee threshold.

It is not intended to suggest that the results should be viewed only within the critical-band frame of reference. Indeed, consideration of various interpretations involving different concepts of the normal masking process has been highly suggestive. Until more experimental data are available, however, such interpretations are probably too speculative to warrant discussion of them here.

Summary

Pure-tone and spondee thresholds, in quiet and in two levels of white noise, were obtained for a number of normally hearing and hypacusic subjects with a view to evaluating the hypothesis that such noise will produce the same amount of masking (M) in an ear which is impaired—whether conductively or perceptively—as it will produce in a normal ear, provided that the effective level (Z) of the masking noise is the same for the two ears.

The number of abnormal M-Z relationships which were found in the data obtained for hypacusic subjects tended to invalidate the hypothesis. The direction of such abnormality appeared to be related to the spectral characteristics of the signal. When the signal was a low-frequency tone or a series of words, M was frequently

less than it would be for a normal ear masked by noise of the same Z level. When the signal was a tone of 3 or 4 kcps, M was frequently greater than normal.

The degree of the M-Z abnormalities which have been mentioned appeared to be influenced by the type of hearing loss. Abnormalities revealed by the masking of subjects with perceptive disorders were generally more pronounced than were those revealed by the masking of subjects with conductive impairments. Degree of such abnormalities also appeared to be proportional to the Z value of the masking noise, which is to say that it was dependent upon the ratio of the noise intensity to the threshold in quiet. The abnormally low masking of low-frequency tones and speech was not common when Z was below 14; however, with higher Z levels, such abnormality was increasingly conspicuous with respect to both degree and frequency of occurrence. Abnormally high masking of moderately high-frequency tones, on the other hand, was rather common even with negative values of Z.

The results suggest that the concept of the 'critical band,' as formulated by Fletcher and his colleagues, may have limited applicability to the masking of impaired ears, especially if the impairment is of the perceptive type.

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Cardiac Reflex To Tones Of Threshold Intensity

David Zeaman

Norma Wegner

Upon presentation of a brief, mild tone, the human subject will display a temporary wave-like alteration of heart rate. This apparently unconditioned response has been observed in a series of cardiac conditioning experiments (*11, 12*) employing a tone as the originally neutral stimulus. Because unconditioned reflexes to sound are mostly elicited by intense rather than weak sounds (*5*), this finding has some novelty. The purpose of this study was to discover whether this effect can be observed at intensity levels near verbally reported threshold. Such a finding might establish the possibility of its use as a sensitive and objective test of hearing.

The nature of the cardiac disturbance following auditory stimulation is shown graphically in Figure 1. The ordinate of the graph represents the average heart rate of a number of subjects each measured 20 times before, during, and after a one second, 512 cps, 60 db tone. The abscissa gives the ordinal number of the heart beat, counting ten beats before the tone, one beat during, and at least thirteen beats after.

Figure 1 shows that there are at least two varieties of responses. The upper curve gives an average for 17 subjects whose response is typical of most of the 80 people tested. During the tone the rate drops about two beats per minute, rises in partial recovery immediately after, falls again to almost the same level, and then returns gradually to pre-tone level in a series of damped oscillations. The bottom curve represents the average

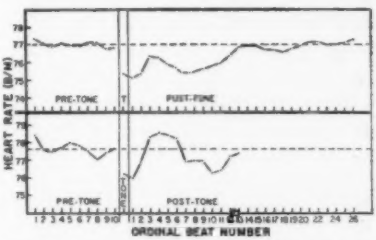

FIGURE 1. The form of the unconditioned response of the heart to a mild acoustic stimulus. The ordinate has the dimension of average heart rate in beats per minute; the abscissa counts the ordinal number of heart beats starting from ten beats before the tone. The upper function represents the mean of 17 subjects designated as the decelerative type of responders; the lower function, the mean of 15 subjects having an accelerative component. These curves derive from data of earlier studies (*11, 12*).

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of a smaller class of subjects whose recovery after the initial deceleration to tone takes the form of a rate increase above the pre-tone level.

There may be some questions as to whether the response depicted in Figure 1 is a conditioned response to fear or an unconditioned response to tone, since all the subjects involved had been instructed to expect electric shocks at some time. Two pieces of evidence strongly suggest that this is an unconditioned response: (1) the conditioned response to fear has been shown to take a somewhat different form (*11*, *12*), and (2) the subjects run in the present experiment, who did not expect shock, gave responses resembling closely those in Figure 1.

Procedure

The over-all plan of this experiment was simply to measure the human cardiac reflex to auditory stimulation at three widely separated intensity levels: threshold level, above threshold, and below threshold.

Subjects. Four experienced psychophysical observers were employed as subjects. Two were male, two female, all between the ages of 21-33, and of normal hearing.

Apparatus. A commercially built clinical audiometer (Maico) was used as a tone source. Tones of varying intensities at 512 cps[1] were delivered with external attenuation through earphones to the subject who was seated in a separate cubicle lined with acoustical celotex. Duration of the tone (6 seconds) was controlled by Hunter Decade Interval Timers wired in series with the audiometer output. Heart rate was graphically recorded in a standard manner by means of a commercially built Garceau electrocardiograph.

Heart rate measurement. Before any heart rate records were taken, an absolute intensity threshold was located for each subject using the standard psychophysical method of constant stimuli (*10*). The heart's response to three intensities of tone was measured over a series of five daily experimental sessions for each subject lasting 45 minutes each. Within a session, 30 tones were presented at irregular intervals of one to two minutes. The three intensity levels were threshold, 27db above threshold, and 48 db below threshold. The different intensities were presented in random order without warning to the subject. His instructions were simply to sit quietly until a tone was heard, after which time he was to say 'Yes' aloud to the experimenter, who was at the control panel of the apparatus outside the cubicle. The cardiograph was turned on 20 seconds before the presentation of each tone and remained on throughout the duration of the tone.

Definition of the Reflex Score. A measure of the cardiac reflex was sought which would be sensitive to both the accelerative and decelerative types of disturbance shown in Figure 1. At the same time, the measure should be insensitive to fluctuations in over-all heart rate not attributable to the controlled auditory stimulation. The difference in rate just before and during the tone was chosen to meet these criteria. Specifically, a Reflex Score was defined as the average deviation, from mean pre-tone level, of

[1]Other audible frequencies have been tried with no change in the form of the heart response. This frequency was arbitrarily selected.

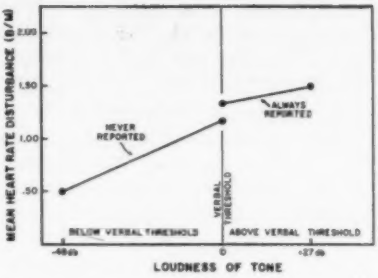

FIGURE 2. The mean heart rate disturbance (Reflex Score) of four subjects of normal hearing is graphed as a function of tone intensity. The mean response to tones reported heard and to those not heard at threshold level are plotted separately.

the heart rate during the tone. Ten time intervals between the eleven beats prior to the tone were converted to ten rate measures (beats/min.) and then averaged. This is the pre-tone level. Each heart beat interval during the tone was also converted to a rate measure. There were usually six such tone rate measures. Each of these was then subtracted from the pre-tone mean. Finally, these differences were averaged without respect to sign to yield the Reflex Score.

Results

Three mean Reflex Scores were obtained for each of the four subjects by averaging over the 50 responses at each intensity level. Since the data for all subjects showed the same trend, they have been pooled and plotted as a single function in Figure 2. All tones at the 27db level were reported as heard by the subjects; none at -48 db was heard; and at threshold, half were heard, half were not. It can be seen in Figure 2 that there is a direct relationship between heart rate disturbance and tone intensity.

There are three statistical questions to be asked about the data of Figure 2. The first is whether the covariation of heart rate and tone intensity is significant. The second asks if the heart response observed at verbal threshold is reliably greater than that to subthreshold tones. The last is whether the subthreshold response (-48 db) is significantly different from the response observed when no tone at all is presented.

To answer the first question, an analysis of regression was performed (*8*) on the pooled data of Figure 2. The regression of heart rate on tone intensity level was found to be significant at the .02 level of confidence. This means that the hypothesis that the mean curve observed in Figure 2 is a horizontal linear function can be rejected.

A *t* test was computed of the significance of the difference between the threshold values of heart rate and the disturbance at the —48 db level. The results indicated that the answer to the second question was positive. At the .02 level of confidence the hypothesis of no difference between threshold and subthreshold heart response can be rejected.

The following statistical facts indicate that the response at—48 db represents no significant disturbance: (1) the average rate level after the —48 db tone was not significantly different than before ($p = .10$) and (2) the average deviation of rate around pre-tone mean level was not significantly different from the average deviation of the rate measurements during the tone ($p = .20$). In effect, this means that the lowest point on the graph represents the general 'noise' level of the heart.

Discussion

The results have shown that the heart response to tone for normal subjects is as evident as the verbal response to threshold and supra-threshold levels. The possibility of its use as a sensitive and objective test of hearing is thus established. Just how sensitive the cardiac reflex is cannot be determined from the data since no attempt was made to locate its threshold.

It is possible that the cardiac reflex may be related to breathing. Investigators of cardiac startle to really loud sounds (*1*, *2*, *7*, *9*), such as gunshot and auto horns, have suggested that the skeletal movement and breathing disturbance produced by sudden loud noise are the direct causes of the change in heart rate. At least two studies (*3*, *13*), have shown that attending to faint sounds has been accompanied by an irregularity of breathing and a slowing of pulse rate. That heart rate accelerates during inspiration and decelerates during exhalation is an experimental fact quite easy to demonstrate (*6*). Thus, if the regularity of breathing of our subjects was interrupted in any systematic way by the occurrence of the tones, the observed changes in heart rate would be expected.

Whatever the underlying physiological mechanism may be, the fact that the cardiac response to tone exists in normal adult subjects points to the possibility that it may be used as a test of hearing for such difficult subjects as infants, deaf-mutes, malingerers, psychotics, aments, and animals.

If the cardiac response appears in nonverberal subjects as it does in normals, it will have a number of advantages over other objective tests of hearing such as the psychogalvanic reflex (*5*) and the cochleopalpebral reflex (*4*). They are: (1) It requires only standard, commercially built apparatus (audiometer and electrocardiograph) of the kind used by physicians; (2) It involves no training procedure for the subjects; (3) It does not require the use of strong stimuli; (4) It shows little adaptation; (5) It appears to be very sensitive; and (6) It is hard to disguise or suppress by voluntary means.

On the other hand, there is one disadvantage that should be mentioned. It is an extremely tedious method. This results from the necessity of making a beat-by-beat analysis of the response. Taking average rate over a period of time is inadequate since the accelerative and decelerative components of the response tend, with this method, to cancel each other out. To illustrate the tedious detail required by a beat-by-beat analysis, it might be pointed out that over 10,000 measurements of heart-beat intervals had to be made with a millimeter ruler to provide the data of Figure 2. The moment-to-moment variability of the heart rate is great enough to demand that many repeated measurements be made on each subject for reliable results.

Summary

An unconditioned cardiac response to mild auditory stimulation has been described. The possibility of its use as a sensitive, objective test of hearing was established by demonstrating with normal adult subjects the presence of the heart response to tone intensities at verbally reported threshold. As an objective test of hearing,

the use of this reflex was observed to be simple from the point of view of equipment and procedure, but somewhat tedious from the point of view of analysis.

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Factorial Analysis Of Speech Perception

Clair N. Hanley

The published research on the perception of speech reveals that most investigators have been almost entirely concerned with the relationships between speech intelligibility and the conditions under which speech is transmitted. The primary interest has been in speech intelligibility *per se*. The speakers represent, so to speak, the necessary sources of sound waves and the listeners constitute necessary indicating instruments for evaluating a particular attribute (speech intelligibility) of those sound waves.

Although information concerning perception has been considered subsidary in many of the research studies, nevertheless it has proved a fruitful field of investigation. Karlin (*3*), Sherman (*6*) and Carhart (*1*) have shown that speech perception cannot be accounted for on a single scale nor by one characteristic of the listener, *i.e.*, ability.

Karlin (*2*) investigated the auditory realm by the technique of multiple factor analysis. By employing a battery of thirty-three tests, he found that eight fundamental common abilities, underlying the area of auditory perception, were required to account for the observed correlations between the tests.

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It was the purpose of this research to determine, by the method of factor analysis, the underlying common abilities or unities of the area of speech perception for listeners having normal hearing for pure tones. An attempt was made to discover . . . 'a set of abilities which will be fewer in number and more fundamental in nature than the original tests (7).'

The first step in devising a battery of tests was to formulate hypotheses concerning the significant sources of variance believed, on the basis of previous experimentation in speech intelligibility, to operate in speech perception. Tests were then chosen which might demonstrate one or more of these sources of variance. At least three tests in which the particular variable is represented are required to determine one common factor.

Table 1 summarizes the test battery with respect to hypothesized factorial structure, tests and materials, and each test's anticipated weighting on the predicted factor. A single *x* indicates that a test is expected to contribute little weighting or loading, two *xx*'s indicate a stronger loading, and three *xxx*'s very strong loading. No *x*'s indicates that a given test is not expected to contain the particular source of variance represented by that factor.

No adequate hypotheses could be made for certain other tests, namely the Seashore Battery of Musical Talent, tests of verbal facility, word dis-

TABLE 1. Hypothesized factorial structure.

Tests	*Time*	*Identification*	*Discrimination*	*Masking*	*Frequency distortion*	*Memory*	*Meaningfulness*	*Threshold acuity*	*Synthesis*	*Analysis*	*Phase*
Pitch			XX			X					
Loudness			XX			X					
Time	XX		X			X					
Rhythm	XX		X			X					
Tonal memory			X			XX					
Silent intervals	XX		X			X					
Low pass filter		X			XXX		X		XX		
High pass filter		X			XXX		X		XX		
Spondee threshold		X					X	XXX	X		
Sentence threshold		X					X	XXX	X		
Limerick masking		X		XXX			X		XX	XX	
Reading masking		X		XXX			X		XX	XX	
Memory for female voices	X	X	X			XX					
Memory for male voices	X	X	X			XX					
Stuttering masking		X		XXX			X		XX	XX	
White noise masking		X		XXX			X		XX	XX	
Nonsense threshold		X					X	XXX	X		
PB threshold		X					X	XXX	X		
Clipped discrimination			X	X	X				X	X	
Clipped PB's		X		X	X		X		X	X	
Sound discrimination			XX			X					
Interrupted discrimination	XX		X				X		X		
Interrupted vocabulary	XX	X					XX		X		
Interrupted sentences	XX	X					X		X		
Reverberant PB's		X		X	X		X		X	X	X
Reverberant sentences		X		X	X		X		X	X	X
Vocabulary		X					XX				
Anti-phasic masking		X		X			X		X	X	XXX
500 cps acuity		X						XXX			
1000 cps acuity		X						XXX			
2000 cps acuity		X						XXX			
4000 cps acuity		X						XXX			

crimination tests, and speech sound discrimination tests, inasmuch as little is known concerning their relevance to speech intelligibility. However, they were included in the test battery as a means for determining possible significant relations between the abilities involved in them and the abilities involved in the various speech perception tests.

Procedure

The test stimuli, with the exception of the reverberation tests and pure tone auditory acuity tests, were tape recorded in a sound isolated room, connected to the main building by electrical and ventilation conduits only. A Presto RC 10/24 high fidelity tape recorder operating at a tape

speed of 15 inches per second was used for the recording and playback. For all tests, except the Seashore battery, the pure tone tests, and memory tests, only one talker was used.

The recording equipment and two-room arrangement used in the recording phase of the study were also used for reproducing the tests to the subjects. The output of the tape recorder was fed to a McIntosh model 20W-2 amplifier. From the amplifier the signal was passed to a Hewlett-Packard 400-A attenuator. The signal was then fed to ten PDR-8 headsets by means of an impedance matching transformer coupled to the headsets in the sound isolated room through a wall junction box. For the speech threshold tests and for the test employing a high pass filter, the Hewlett-Packard attenuator was used to vary the sensation levels of the test stimuli. In all other tests of the battery, the sensation level was fixed at about sixty db and the control settings on the attenuator were constant.

Test Administration. As a first step in the test administration, it was necessary to be certain that the subjects (105 university students) had normal hearing acuity. Normal hearing acuity is here defined as a threshold for pure tones not exceeding a 15 db loss at 500, 1000, 2000 or 4000 cps as determined by a Maico model E-1 audiometer. This initial testing program served the dual purpose of rejecting any subject with hearing loss and affording an initial interview for the scheduling of listening sessions. Since the listening room accommodates only ten persons, fifteen sessions were held each week to complete one test session for the entire group of 105 subjects. The listening groups averaged seven subjects.

Each listening session was kept as short as possible, so that the effects from fatigue might be minimized and the motivational level kept as high as possible. On the average, a single test required five minutes. A thirty-to-forty minute session allowed the completion of four tests. The time not consumed in actual testing was used for the instruction period and the changing of tape reels.

For each session, tests were carefully selected on the basis of three considerations: (1) the time required in administration; (2) reduction in the interaction effects, *i.e.*, the effects from a preceding test; and (3) the physical equipment necessary to give the test.

Tests. The following tests were given the first week: (1) the Seashore test of pitch discrimination which required the subjects to judge whether the second tone of a pair was higher or lower in pitch than the first; (2) the Seashore test of loudness discrimination which required the subjects to judge whether the second tone of a pair was louder or softer than the first; (3) the Seashore test of time sense which required the subjects to judge whether the second tone of a pair was longer or shorter in duration than the first; and (4) the Seashore test of rhythm which required the listeners to decide whether the second tonal pattern was the same as the first. These tests in their original form are recorded on phonograph discs. However, for ease of administration they were copied on magnetic tape.

During the second week the following four tests were given: (5) the Seashore test of tonal memory which required the listeners to judge whether the pitches of one tonal pattern differed from another pattern;

(6) the Seashore test of silent time which required a judgement similar to the test for duration of tones. In this instance, however, the time judgement was to be made in terms of time elapsed between tones. (7) PB words were tape recorded after being fed through a 670 cps low pass filter. The listeners were asked to write down the words heard. (8). This test was similar to the previous test except that a 4000 cps high pass filter was employed.

In the third week two speech threshold tests and two maskings tests were administered. (9) Fifty spondaic words, recorded at a constant intensity level were played to the listeners. At the end of each group of five words, the intensity level in the listeners' headphones was reduced. The stimuli began well above threshold, and at the end of the list of fifty they were well below threshold for most of the subjects. (10) Harvard intelligibility sentences, questions answerable by one or two words or a number, comprised the second speech threshold test. It was administered in precisely the same manner as the spondee threshold test. (11) Fifty limericks were recorded on the Magnecord model PT-6. The speaker who read the limericks was instructed to pause for a few seconds between the second and third lines of each limerick to allow a second speaker to read the number of the stimulus sentence which he was to read simultaneously with the last three lines of the limerick. Thus, the last three lines of the limerick functioned as masking material for the intelligibility sentences. The listeners were instructed to write down the answers to the sentences. (12) One alteration in recording technique was employed in this test. Relatively neutral prose material served as the masking material, but due to the difficulty in coordinating pauses in this material with the sentences, all pauses over one-half second in duration were spliced out of the masking tape rendering it essentially continuous. The speaker who read the test sentences was asked to read the sentence number with a considerable increase in vocal intensity to aid the listeners in keeping pace. As before, the listeners were to write down the answers to the sentences.

In the fourth week two voice memory tests and two masking tests were administered. (13) Each of fourteen different female speakers read one or more of thirty prose passages. The voices were randomized as to the order of their appearance. Six of the speakers were heard only once on the tape (to lower the probability of successful guessing), whereas eight of the speakers' voices were repeated one or more times, reading in every case different material. The listeners were asked to judge, for each voice presentation, whether or not they had heard that particular voice on that tape previously. (14) Test 14, is identical to test 13 with the exception that male voices were used. (15) This stuttering masking test is essentially the same as test 12, however, it was not necessary to splice out the pauses in the masking tape since the stutterer chosen vocalized almost continuously, and very few pauses were to be found on the tape. The listeners were told to answer the stimulus questions. (16) The signal from a white noise generator was tape recorded and a continuous loop of tape was used on the Magnecord to provide the masking for the same type of sentence material.

In the fifth week two more speech threshold tests were administered as well as two tests employing an infinite peak clipping device. (17) Consonant-Vowel-Consontant (CVC) nonsense syllables were recorded in the same manner as the spondee words and were then played to the listeners at reduced intensity values. A practice session was held to show the subjects how to write the symbols used in this test. (18) The last speech threshold test, constructed in the same manner as the others, was a threshold for PB words.

For the clipping tests, the speech signals were passed from the Presto recorder to the McIntosh amplifier and then led to the clipping device. (19) This was an author-designed test and contained fifty items which were passed through the aforementioned clipper. For each item three words are listed as possible response choices. The three words differ in one phonetic element. For example, one of the items is: *faith, face, fate.* The listeners were instructed to underline, opposite the list of three choices, the word spoken. (20) In this test, PB words were passed through the clipping device and the listener was asked to write the words heard.

During the sixth week the following tests were administered: The Templin Speech Sound Discrimination test; a word discrimination test under a distortion condition; a vocabulary test also given under distortion; and sentences under distortion. The Templin Speech Sound Discrimination test, although administered, was dropped from succeeding interpretation because the subjects, at the poorest, scored only two errors. If there is no variation in a task then there can be no factoring.

Test 21 was an author-designed word discrimination test similar to test 19. The test employed an electronic switching device which allowed the speech signals to pass only intermittently. This device was based upon the circuit used by Miller and Taylor (*5*). The duty cycle (the duration of speech relative to the silence) was fixed at fifty per cent. The rate of interruption was set at seven per second. To insure that the listeners would hear the speech sounds interrupted in exactly the same way, the interrupted signals were prerecorded. The subjects were required to underline the proper word in each group of three as before.

Test 22 employed the same switching device. In this case, words were presented from a standard vocabulary test constructed by Thurstone. Each subject was given a sheet of paper on which were written five synonyms for each of forty test items. Subjects were asked to underscore the proper matching synonym.

Test 23 contained sentences heard under the same interruption type of distortion. These sentences range from six to eleven words in length and are simple statements of fact. Each of them contains five key words. By understanding these five key words, the individual is able to understand the meaning of the entire sentence, even though some of the other words are not heard or are heard incorrectly. The subjects were instructed to write the entire sentence but only the five words were scored for accuracy.

In the seventh week only three tests were attempted. These were: Test 24, a test of the subjects' ability to understand PB words recorded in a reverberant room. The recording

equipment was transported to another room in the building whose reverberation characteristics were deemed suitable for purposes of the test. A reverberation time was roughly determined at about three-to-four seconds. Test 25, using the same recording technique, employed sentences as described in test 23. Test 26 was a vocabulary test by Thurstone. This test was administered without any distortion or masking in order to study possible variation in perception as influenced by vocabulary level.

Test 27 was the only test given during the eighth week due to the fact that it necessitated rewiring the listening room. PB words were fed to both phones of the listeners' headsets in phase. The noise from the white noise generator was fed to one phone 180 degrees out of phase with the noise in the other phone.

Tests 28, 29, 30, and 31 were tests of hearing. Although the subjects had previously been screened to rule out hearing loss, an audiogram for 500, 1000, 2000, and 4000 cps was obtained for each of the subjects in the ninth week of testing to obtain more definitive information regarding their hearing. Inasmuch as binaural listening was employed in all other tests of the battery, the lower threshold value for each frequenc was chosen, regardless of the ear in which this value was determined.

TABLE 2. Rotated factor matrix (with decimal points omitted).

	Factors							
Tests	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*
1	-05	-05	56	01	01	-05	03	12
2	21	-11	33	-12	05	04	-08	-06
3	09	02	42	-08	-10	07	02	04
4	16	09	36	05	25	-02	-04	00
5	-04	06	60	17	22	-12	04	06
6	02	03	54	07	16	-02	22	-09
7	03	-09	15	21	58	-09	02	-05
8	00	15	-09	10	32	09	10	44
9	-01	49	00	-05	-02	07	-09	60
10	-05	48	-02	01	-09	20	01	49
11	04	-04	-06	11	-09	71	02	07
12	02	-02	05	03	-03	70	00	-05
13	-01	-02	-01	42	-07	00	15	27
14	-01	-04	-04	66	-01	02	-05	03
15	-02	03	05	-12	06	63	66	10
16	-06	15	03	10	-09	80	61	-09
17	06	35	21	03	07	-06	28	49
18	05	40	07	12	-08	-09	16	50
19	-08	04	12	03	28	11	-02	-09
20	16	07	-09	03	60	-07	21	05
21	14	10	16	22	14	00	-11	-12
22	78	13	04	-05	12	02	05	-05
23	19	-13	-09	-07	23	18	06	35
24	-03	02	-04	-04	53	03	37	34
25	-02	-05	-05	-06	47	10	38	35
26	76	00	-03	02	-08	-04	-07	09
27	-05	-09	-05	28	24	-02	-09	14
28	09	67	25	-08	-11	13	-08	-06
29	-07	66	28	12	18	05	01	03
30	-02	59	01	-08	05	-01	07	22
31	00	57	-10	-05	15	-17	23	18

TABLE 3. Simplified rotated factorial pattern (with decimal points omitted).

Tests	*Verbal facility*	*Tonal detection*	*Seashore battery*	*Voice memory*	*Resistance distortion*	*Resistance masking*	*Unpleasantness*	*Synthesis*
Vocabulary interrupted	78							
Vocabulary	76							
Spondee threshold		49						60
Sentence threshold		48				(20)		49
Nonsense threshold		35	(21)				(28)	49
PB threshold		40						50
500 cps acuity		67	(25)					
1000 cps acuity		66	(28)					
2000 cps acuity		59						(22)
4000 cps acuity		57					(23)	
Pitch			56					
Loudness			33					
Time			42					
Rhythm			36		(25)			
Tonal memory			60		(22)			
Silent intervals			54				(22)	
Memory female voices				42				(27)
Memory male voices				66				
Low pass filter				(21)	58			
High pass filter					32			44
Clipped PB's					60		(21)	
Reverberant PB's					53		37	34
Reverberant sentences					47		38	35
Interrupted sentences					(23)			35
Limerick masking						71		
Reading masking						70		
Stuttering masking						63	66	
White noise masking						80	61	

Treatment of the Data

Pearson product-moment correlation coefficients were computed for all possible pairs of tests in the battery, using I.B.M. tabulating equipment. Six factors were determined by the multiple group method of factoring and two additional factors were defined by the complete centroid method. Table 2 indicates the derived factor matrix. The tests are listed down the side of the table. Across the top of the table are listed the as-yet undefined factors found in the test analysis. The numbers within the body of the table can be thought of as correlation coefficients relating the particular test to the factor indicated at the head of each column. For example, test 1 (pitch discrimination) appears to be significantly related to Factor C only as the coefficients for other factors are zero or nearly so.

In order to interpret the nature of each factor, one notes down all those tests which are more or less strongly related to the factor in question. In this study, all tests showing a weight-

ing (correlation) of .30 and above on a particular factor are included. Tests with weightings of .20 to .29 are considered in some cases as possible clues to the factor's identity. When a group of tests are assembled which bear a significant relationship to the factor, a close inspection is made of the tests to determine in what way they are similar. A good example of this can be seen by an inspection of Table 2. Factor A has only two tests which are heavily weighted, tests 22 and 26. Test 22 is a vocabulary test designed by Thurstone, administered under an interruption type of distortion. Test 26 is also a Thurstone vocabulary test. Since the common element to be found in these two tests would very obviously be the vocabulary element, this factor was designated a Verbal Facility factor.

Not only are the tests correlated with the factors but it is possible, and quite necessary, to discover the correlations existing between the factors. All too frequently it is quite difficult to interpret the factor by noting similarities in tests which are related to it. Factor identification can be assisted in great measure by relating one factor to another factor, the identity of which can be more easily determined or which has already been determined.

Table 3 shows the factorial pattern eventually defined. At the top of the table are the names established for each factor, while down the side of the table the tests are listed. It must be mentioned at this point that these factors are considered as only rough approximations to the variables that may eventually be specified. Not all possible facets of speech perception have been, or could possibly be, represented in an initial study of this kind. Table 4 shows the correlation matrix which depicts the correlations existing between the factors. It was used extensively in determining the nature of the factors.

Factor Definition

Factor A—The Verbal Facility Factor. This factor was defined by the two vocabulary tests. In the design of the study, these two tests were postulated as criterion tests for a verbal facility factor which would relate to some of the verbal response measures to be found in other tests of the battery. The lack of relationship is probably due to the population sampled and to the test materials employed. For all verbal tests, with the exception of the two on this factor, the test materials employed were quite easy for this college population; hence the individual differences were related to sources of variance other than

TABLE 4. Matrix R showing the correlations between primary vectors (with decimal points omitted).

	A	*B*	*C*	*D*	*E*	*F*	*G*	*H*
A	....	−190	160	209	167	172	−005	202
B	−190	....	−060	−250	−058	−152	−049	−075
C	160	−060	....	−004	062	282	−081	366
D	209	−250	−004	....	074	096	161	028
E	167	−058	062	074	....	445	−347	202
F	172	−152	282	096	445	....	−441	388
G	−005	−049	−081	161	−347	441	....	−230
H	202	−075	366	028	202	388	−230	....

the verbal facility factor. It was not possible, with this battery, to test the hypothesis that a verbal facility factor would be defined with a gradation of factor loadings from tests with different vocabulary levels. The present study made use of only two difficulty levels, very easy and quite difficult.

Factor B—The Threshold of Detectability for Tones Factor. All eight threshold tests used in this study showed significant weighting on this factor. Clues to the identity or definition of the factor come mainly from three findings:

1. The weightings of the pure tone tests on this factor exceed the weightings of the speech tests. Clearly, the threshold for pure tones is a detectability threshold. The heavier weightings of the pure tone tests indicate that they are, more logically, the criterion tests for this factor. Inasmuch as all eight tests appear on the same factor, it is necessary to ascribe to the speech tests a source of variance common to the more heavily weighted pure tone tests. By presenting speech materials in ascending and descending intensity levels to a group of subjects, it is possible to determine two different thresholds. One threshold, the usual one, yields values relative to the intensity level necessary for the subjects to identify correctly 50 per cent of the material. The other threshold, at a lower intensity setting, is defined by the subject's ability to indicate when something is present regardless of whether he can identify the stimulus. This latter has been labeled the threshold of detectability and is analogous to the response made to pure tone tests.

2. At an intensity slightly greater than the threshold of detectability, the vowels and stronger consonant sounds would be perceived. On the basis of these cues, subjects frequently are able to supply the missing sounds and make correct identifications. Some words or groups of words contain sound configurations that make this identification easier. These words are said to have high 'context cue value'. Intuitively, and on the basis of some experimental evidence (*4*), the gradation of the test materials according to the relative number of cues needed for identification was: Harvard sentences, spondees, PB words, and lastly, nonsense syllables. The speech test loadings on this factor follow a similar gradation with the exception that the Harvard sentences and spondees have nearly equal loadings. The gradation of factor loadings from the speech tests is most meaningful when viewed from the standpoint of the necessity or usefulness of vowel or tone detection.

3. This factor was found to be independent of the *H* factor, which is defined as a 'synthesis' factor. The speech threshold tests are heavily weighted on the *H* factor and the pure tone thresholds are not weighted on the *H* factor. This would indicate that a synthesizing process, present in speech materials, must be absent in a detectability threshold.

Factor C—The Seashore Battery Factor. Only the six tests from the Seashore Battery showed weightings on this factor. In designing the experiment, this battery was included in the hope that these comparatively simple tests might prove to be highly correlated with certain basic factors in speech perception. For example, pitch was hypothesized as a factor, hence the Seashore test of pitch discrimination was included on the supposition that it would exhibit a source

of variance in common with certain speech tests. Similar hypotheses were made for other tests of the battery. Evidently the variables measured by the Seashore tests are not those which influence speech perception as defined by this battery.

Factor D—The Voice Memory Factor. Only the memory for male and female voice tests appeared on this factor. These memory tests were included in the battery to test the assumption that there are common sources of variance in the perception of speech and in the ability to recognize and recall voices. Other tests of the battery, such as pitch, loudness, time, tonal memory, and perhaps threshold tests were expected to yield information as to the clues used by listeners in recognizing voices. It is quite evident that this factor is related to none of the above-mentioned tests.

Factors E and F—Resistance Factors. Factor *E* was defined by tests employing a distortion device, excluding masking, which also used monosyllabic words as the stimuli. One test, threshold for PB words, did not show any weighting on this factor. It is therefore hypothesized that the people who recognize words most easily at threshold are not the same ones who resist distortion of these words above threshold most successfully.

Factor *F*, found to be highly correlated with Factor *E*, was also termed a resistance factor. As in Factor *E*, two common elements within the tests help in the definition. The tests which show weightings on this factor were all masking tests and all employed Harvard sentences. Further evidence for this factor's designation comes from two other tests: sentence threshold and anti-phasic making. The Harvard sentence threshold is the only other test in the battery employing Harvard sentences. Although its weighting is slight, no test, other than the masking tests, has a weighting as large.

Anti-phasic masking used PB words; the listeners, when asked to evaluate the relative effects of this test as compared with the other white noise masking test, indicated that the anti-phasic masking did not 'act' like masking to them. They reported that the temporal location of the stimulus and the masking were quite separate and distinct. In general, the noise was heard in one ear and the stimulus in the other, and in only a few cases were the two observed 'together'. The statistical analysis revealed that this test was significantly different from other masking tests.

Factor G—The Unpleasantness Factor. This was the most difficult factor to interpret and this designation is only tentative. Oddly enough, certain tests play important roles in the identification of this factor by the fact that they do not have significant loadings. The following points should be noted: (1) Only distortion tests have significant weightings; (2) two masking tests have high loadings and two do not; (3) the test materials are varied; and (4) anti-phasic masking again is separated from white noise masking. The major clue to the interpretation of this factor is to be found in the split of the four masking tests. The limerick and reading masking tests were described by the subjects as, 'easy', 'fun' and 'interesting', whereas stuttering masking and white noise masking were 'disturbing' to the extent that one listener refused to continue in the test situation. The lat-

ter two tests showed the greatest loadings on this factor. The other tests assisting in the definition were distortion tests (reverberation) employing material with little contextual cue value and termed 'hard'.

Factor H—The Synthesis Factor. The tests which appear on this factor are the speech threshold tests, high pass filter with PB's, reverberant sentences, and interrupted sentences. In all tests on this factor, the response measure required the listener to identify a word or group of words only partially heard. That is, the listener supplied subjectively, using available cues, the parts not heard in order to identify the whole. That other tests necessitating this ability to synthesize segments do not present significant, heavy loadings on this factor, is in some cases, unexplainable. In others, the assumption is that the common variance of the tests are extremely low or other sources of variance relatively more important.

Conclusions

This factorial analysis was undertaken to bring about order in a realm which, at first glance, might seem quite chaotic. The basic assumption of the factor analyst is that it will be possible to describe performances in a domain employing a smaller number of variables or defined concepts than the number that can be developed as appropriate to the domain. This study employed thirty-two tests which the factor analysis reduced to eight variables.

On the basis of the data gathered in this experiment, the following conclusions seem warranted:

1. The Verbal Facility Factor was identified in this study but appeared to be unrelated to speech perception measures. Through more adequate testing procedures, employing a less verbally homogenous population, the relationships between this factor and speech perception measures may be determined. With regard to verbal measures, it must be recognized that a college population is not a representative listening group. The use of such a group places restrictions on the investigator who wishes to generalize his results.

2. It has been shown that speech threshold tests contain at least two very important sources of variance, a Threshold for Detection of Tones and a Synthesizing process. The pure tone threshold tests, on the other hand, seem to contain only one of these sources of variance, namely, the Threshold for Detection of Tones. The source of variance common to both types of tests allows for some prediction, but the source of variance found only in the speech threshold tests has been shown to be independent of the tonal detection variable; hence, the prediction from pure tone test to speech threshold test should be made with extreme caution. Further, the relationships between pure tone tests and speech perception measures, other than speech threshold tests, are weak and predictions must be made without the benefit of statistical justification from this study.

3. It is quite probable that three first-order factors determined in this study, on further factoring, would define a more basic (second order) factor. Reference is made here to Factors *E*, *F* and *H*. The intercorrelations between these factors indicate the operation of a source of variance common to all three.

4. The interrelationships of the Sea-

shore Battery Factor with other factors in the battery is obscure and adequate evaluation must await future investigation.

5. The results of this study did not yield a great deal of information concerning the cues listeners employ in recognizing voices. The negative correlation between this factor and the *B* (threshold) factor might be interpreted to mean that the individuals with a high degree of tonal sensitivity are not necessarily the ones who recognize voices well.

6. The Unpleasantness Factor is only very tentatively identified here. The clues employed in its identification, although numerous, are too often derived from insight rather than statistical confirmation. The defining of this factor in this study would seem to indicate that although a task is unpleasant it may not affect adversely the individual's scores, and may even tend to have the opposite affect.

7. Since the correlations among a few of the primary vectors seem to be significant and to aid in the interpretation of some of the first-order factors, a further analysis of second-order factors may be indicated, providing present results are found to be reproducible. Such an analysis would utilize the present intercorrelations among the primary factors as well as results from a battery designed to investigate hypotheses concerning the second-order factors.

Summary

One hundred and five students at the State University of Iowa were given thirty-two tests in control conditions. The scores on these tests were analyzed to determine consistencies which would indicate the various factors operating in the area of speech perception. Eight factors were found and tentatively identified.

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Effect Of Acoustic Environment Upon Speaker Intelligibility

Robert W. Peters

In many communication systems the speaker operates in the presence of a wide variety of acoustic signals. This is especially true in aircraft control towers and other similar situations where a number of voice messages are being received and transmitted simultaneously. The results of previous experimentation have indicated that the speaker responds to his immediate acoustic environment by raising his voice level as the level of heard pure tone and noise stimuli is increased (*1, 3, 4*) and by imitating the precision of heard stimuli in his vocal response (*2*).

The possibility arises that the intelligibility of the speaker may be influenced by the signals present in his auditory environment as he speaks. The present experiment was concerned with the effect upon speaker intelligibility of various acoustic signals heard by the speaker while reading to a group of listeners.

Procedure

Thirty-six speakers, drawn from a population of cadets in the Naval Aviation Training program, served as experimental subjects. The criterion measures were percent intelligibility scores obtained from panels of listeners drawn from the same population. Each panel consisted of from 12 to 15 listeners. The speakers each read 12 lists from either Form A or B of the multiple-choice intelligibility tests (*7*). Each speaker read two lists while simultaneously hearing one of six types of acoustic signals. These signals were selected to represent conditions which might confront a speaker operating in a number of circumstances and consisted of (a) the same words as the speaker was reading, (b) similar words which could be confused with the words the speaker was reading (*8*), (c) unrelated words which would not easily be confused with those the speaker was reading (*5*), (d) nonsense words which were a backward reproduction of the same words the speaker was reading, (e) meaningful 'flight-patter' phrases (*9*), and (f) 'babble' which was prepared by overlapping a number of 'flight-patter' phrases on a single recording.

The stimulus material for the acoustic signals was recorded on disks by a single voice. The disk recording of the material permitted randomization of the order of presentation of the acoustic signal conditions to the speaker.

The speakers read the intelligibility lists while seated in a small sound-

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TABLE 1. Summaries of analyses of variance for evaluating speaker intelligibility under six conditions of acoustic signals.

Source of Variation	*df*	*ss*	*ms*	*F**
Voice signal modified by limiting				
Conditions (C)	5	602	120.4	3.23†
Speakers (S)	35	13686	391.0	
C x S	175	6532	37.3	
Total	215	20820		
Voice signal not modified by limiting				
Conditions (C)	5	1103	220.6	5.06‡
Speakers (S)	35	35274	1007.8	
C x S	175	7635	43.6	
Total	215	44012		

*$F = ms_C/ms_{CS}$

† Significant beyond 5% level

‡ Significant beyond 1% level

treated room. The source pick-up for their voices was a condenser microphone (Altec-Lansing, Model 21C) boom-mounted adjacent to the corner of the mouth. The acoustic signals were presented to the speakers through earphones (PDR-8 receivers) at a calibration level of 0.1 volts (Hewlett Packard, Model 400 C voltmeter) measured across the receiver terminals with a 1000 cps input signal. For these particular receivers, this represented a sound pressure level of approximately 80 db (re .0002 dyne/cm^2) at the speaker's ears. The acoustic signals were all presented in the same temporal pattern with the same identifying carrier numbers as the material which the speaker was reading. For example, if the speaker was reading in the presence of similar words, he would hear: 'Number one warm campus port,' while he read, 'Number one swarm canvas quart.'

The speaker was instructed to read at his normal level and to attempt to read simultaneously with the recorded material he was hearing. A three-second, 1000-cycle tone preceded each acoustic signal and provided the subject with an auditory cue to prepare to read the next portion of the intelligibility list. Each subject practiced the experimental task before the reading of the actual test material.

Each speaker's reading of intelligibility lists was heard simultaneously by two panels of listeners. The speaker's voice signal to one panel was subjected to limiting (Langevin limiter) to maintain a relatively constant signal level irrespective of the speaker's change in level under the experimental conditions; the signal fed to the listeners in the other panel allowed the speaker's changes in sound pressure level to be transmitted. This procedure was used on the assumption that if voice level differed with respect to the six experimental conditions, and only these changes contributed to differences in intelligibility, then intelligibility would differ more for the voice signal which had not been modified than it would for the signal which had been limited. The listeners in both panels heard the speaker's voice through earphones (PDR-3 re-

ceivers) at a sound pressure level of approximately 95 db. The listeners were simultaneously exposed to 114 db of free-field, simulated propeller-type aircraft noise. Each of the two listening panels responded to the reading of intelligibility lists by two speakers.

Results and Discussion

Each of the 36 speakers read 12 intelligibility lists. Two lists were read under each of the six conditions in which simultaneous acoustic signals were heard. The criterion score was the mean intelligibility value on these two lists given each speaker by his listening panels. For each of the evaluations of differences among mean speaker intelligibility values, the speaker's voice signal modified and not modified by limiting, there were 216 criterion measures.

Summaries of the analyses of variance for evaluating mean intelligibility of speakers reading under six conditions of acoustic signals are shown in Table 1. Differences among acoustic signal conditions were significant beyond the five percent level with the speaker's voice signal subjected to limiting. Differences among acoustic signal conditions, with the speaker's voice signal not modified by limiting were significant beyond the one percent level.

A comparison of the mean values shown in Table 2 indicate that speakers, with the voice level not modified by limiting, were more intelligible under conditions of hearing nonsense words or similar words while reading than they were under the conditions of hearing the same or unrelated words simultaneously with the reading of intelligibility lists. The speakers were also significantly more intelligible when reading under conditions of hearing 'flight-patter' phrases and 'babble' than they were while hearing the same words.

Similar results were found, as indicated in Table 2, when the level of the speaker's voice fed to the listeners was modified by limiting. Mean intelligibility was significantly higher under the conditions of hearing 'flight-patter' phrases and nonsense words while reading than it was under the conditions of hearing the same or unrelated words. Further, mean

TABLE 2. Mean intelligibility values for speakers reading multiple-choice intelligibility lists under six conditions of acoustic signals.

	Acoustic Signal					
	Same Words	*Similar Words*	*Unrelated Words*	*Nonsense Words*	*Flight Phrases*	*Babble*
Voice signal modified by limiting† Scores %*	67.0	69.3	66.6	71.5	70.0	68.3
Voice signal not modified by limiting‡ Scores %*	61.2	65.0	62.2	68.2	64.6	64.9

*Critical difference (c.d.) = $t(2ms_{error}/n)^{1/2}$

†c.d.$_{.05}$ = 2.8; c.d.$_{.01}$ = 3.7

‡c.d.$_{.05}$ = 3.0; c.d.$_{.01}$ = 4.0

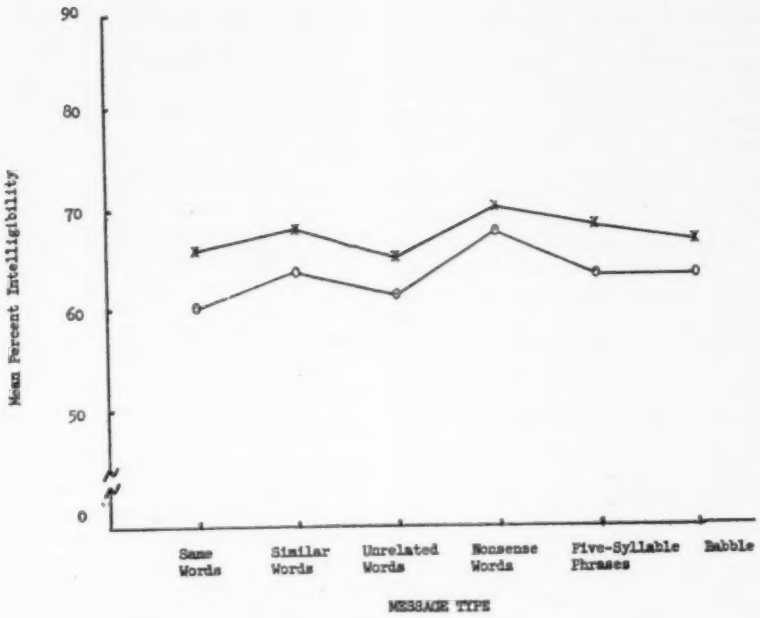

FIGURE 1. Mean speaker intelligibility under six acoustic signal conditions. X = Level modified by limiter; O = Level not modified by limiter.

speaker intelligibility was higher for similar words than for the speaker's hearing the same or unrelated words while speaking. The differences between means approached but did not reach the five percent level of confidence.

Mean intelligibility values for speakers reading while hearing the various signals are portrayed graphically in Figure 1. It may be noted that the same mean intelligibility patterns occur for both panel listening conditions. The higher scores which accompanied the voice signals subjected to limiting may be due to a combination of factors: (a) a lower average free-field level of noise existed at the ears of these listeners due to their position in relation to the source of noise in the testing room, and (b) the action of the limiter maintained a higher signal level at the headset than was maintained by the individual speaker. The difference between the two sets of scores, since the patterns of mean values are similar, is not important to the results of the present experiment.

The results suggest that the effect of hearing simultaneous acoustic signals upon the intelligibility of the speaker is relatively independent of fluctuations in sound pressure level of speaker response occasioned by the presence of the signals.

The finding of lowered intelligibility when the speaker was hearing the same words as he was reading

suggests that the acoustic signal in this instance could be raising the perceived side-tone level, thus causing the sound pressure level of response and precision of articulation on the part of the speaker to be lowered. The increase in speaker intelligibility, with respect to the speaker hearing similar and nonsense words as compared to hearing the same and different words, may also relate to the side-tone monitoring system. The similar words and nonsense words may have required the speaker to raise his voice level and be more precise in his articulation in order that he experience a satisfactory side-tone signal, differentiated from the signals that he was hearing. The unrelated words, due to their being heard as different from the words the speaker was reading and not being heard as lacking in intelligibility, may have not greatly interfered with the speaker's side-tone signal. This could have accounted for the lowered speaker intelligibility for unrelated words.

The speakers were instructed to read in unison with the materials which they were hearing and they practiced this task before the reading of test materials. The results are necessarily dependent upon simultaneous occurrence of sent and heard messages. In an actual communication network the overlapping of the two messages would very considerably. The extent to which similar results, as those found in this study, could be expected to be operative in a communication situation would probably depend upon the degree of overlap of the message the speaker was hearing and the message he was transmitting.

Summary and Conclusions

The present experiment was concerned with the effect upon speaker intelligibility of the type of acoustic signal heard by the speaker while reading. The acoustic signals were selected to represent a variety of conditions under which speakers in communication systems would be likely to operate. The results indicate that the type of acoustic signal heard influences speaker intelligibility. Speakers were more intelligible while they were simultaneously hearing nonsense words or similar words than they were while hearing the same words or words unrelated to those words which they were reading. The differences in speaker intelligibility, with respect to the various acoustic signals, may relate to the speaker's side-tone monitoring system. In the presence of acoustic signals, the speaker may modify his speech so that he perceives his voice signal as being precise and differentiated from the voice signals which he is hearing. The degree to which the speaker modifies his speech is thus dependent upon the characteristics of the heard acoustic signal.

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Graduate Theses In Speech And Hearing Disorders - 1954

Franklin H. Knower

One hundred and fifty graduate theses titles were reported in the field of speech and hearing disorders for 1954. Master's degrees accounted for one hundred and ten of these titles. There were forty doctorates. These degrees were conferred by forty-eight graduate schools. The names of these schools are listed alphabetically in the following report of titles. Under the institutional name the level and title of degrees are indicated. Within each classification of degree title, the names of the recipients of the degrees are arranged alphabetically, and followed by the title of the thesis each presented. Each thesis title is numbered. An index is presented in which theses numbers are classified on the basis of content suggested by the titles. Doctorate dissertation numbers are followed by an asterisk in the index.

Titles

University of Alabama

M.A. Theses

1. Blanton, Martha Jane. The study of speech in interpersonal relationships: Change-in-topic in group conversation.
2. Cagle, E. Faye. The study of speech in interpersonal relationships: Certain aspects of variation in word length.
3. Cox, Barbara Eames. The study of speech in interpersonal relationships: Techniques for analyzing visible and audible aspects of behavior.
4. McKnight, Nita Elizabeth. The study of speech in interpersonal relationships: Analysis of word length by topics in conversation.
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6. Willimon, Harriet Ann. The study of speech in interpersonal relationships: A study of vocabulary in conversation.

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11. Kagan, Marion and Kaufman, Marilyn. A preliminary investigation of the relationship between functional articulation disorders and responses on the children's apperception test.
12. McKinney, Jean. A comparison of the social competence of children with articulation defects to the social competence of children with normal speech.
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Franklin H. Knower (Ph.D., University of Minnesota, 1933) is Professor of Speech, Ohio State University.

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Florida State University

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New York University

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Book Reviews

Brodnitz, Friedrich S., *Keep Your Voice Healthy*. New York: Harper and Brothers, 1953. Pp. 234. $3.50.

By the author's statement this book is intended 'for anybody who uses the speaking or singing voice in his day's work.' This includes laymen, professional people, and the individual 'who experiences troubles with his own voice.' The book covers such topics as the structure and function of the organs producing voice, the characteristics of speaking and singing voices, hygiene of the voice, self-treatment of colds, medical objectives in the examination and treatment of the vocal organs, and disturbances of the singing and speaking voice.

Such a book must have been difficult to write inasmuch as several requirements have to be met if the author's purpose is achieved. On the one hand, the author must present sufficient background information to help the general reader understand the clinical discussions of voice disorders and their treatment. At the same time, he must avoid the presentation of highly specific clinical information which might lead the reader to an ill-founded conviction that he can diagnose his own or other people's voice problems from knowledge gained from this book alone. The author (or the publishers) of such a book should present information which has been carefully checked for accuracy, and should organize the material in a format which makes information on special topics easily accessible to the reader.

The reviewer cannot say without qualification that these standards have been met. Nevertheless, the book presents some sound clinical observations and some very useful suggestions on the care and training of the voice.

The style of the book is discursive and conversational. The author has evidently made considerable effort to keep the text interesting, with a sprinkling of bits of incidental information and items of historical interest. Unfortunately, sentence structure is often awkward.

Certain topics of useful background information about voice have been included. Twelve figures and five plates illustrate the text, but more illustrations are needed to assist the uninformed reader in understanding the structures and functions described.

The most disturbing defect of the book is the number of mis-statements of fact which are included. For example:

> The two lowest ribs . . . do not take part in the movement of the chest. (page 21)
>
> Moving the ribs downward contracts the chest in all dimensions . . . (page 22)
>
> By *resonance* we describe any process by which the energy of a musical sound is augmented. (page 36)

There are other statements, given as fact, which can be contradicted by a good deal of reliable evidence. For example:

> Chest breathing is more pronounced in women and abdominal breathing in men. (page 40)
>
> In quiet breathing the expiration takes about one half more time than the inspiration. (Page 41)
>
> This complex mechanism [referring to the speech organs and respiratory mechanism] is under the control of a *motor speech center*.

Such statements indicate carelessness at best, and in some instances, a failure to consult volumes of carefully written scientific reports available on many phases of the physiology and acoustics of voice, and the neuropsychology of cortical function. It is apparent that the author is best acquainted with European sources of information and has relied on secondary, and occasionally very superficial, American references.

Most of the errors and confusing statements occur in the discussion of background material. If the reader can overlook such defects and will pay attention mainly to clinical observations, of which there are many, he will find information that is not easily available through other sources. Some of this will be useful to laymen and specialists alike, particularly with reference to voice hygiene. It is evident that the author is aware of many important

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Book Reviews is edited by Ernest H. Henrikson, University of Minnesota.

functional aspects of voice which are not generally considered by medical men.

This book has drawn attention to a generally neglected field. One can only wish that the author and his publishers had devoted more time and painstaking effort to editing of the book, and had omitted in the last two chapters reference to stuttering and other defects of speech which are discussed in too superficial a way to be useful to anyone.

H. Harlan Bloomer
University of Michigan

Dr. Brodnitz was a laryngologist and specialist for voice and speech disturbances from 1928 to 1937 in Berlin, and since 1938, in New York City. His book is intended chiefly for singers and speakers who seek information concerning the voice and its common and less common ailments.

Perhaps the best chapters are those directly related to vocal abnormalities and hygiene, while the supporting chapters on vocal physiology and acoustics and the supplementary chapters on stuttering and speech disturbances are a bit disappointing. Speech therapists, however, will probably find the book stimulating and rewarding.

Dr. Brodnitz marvels (and not alone!) at the vocal and phonetic ignorance of most singers, speakers, and their teachers. Following Manuel Garcia (to whose memory this book is dedicated), he explains much that is known about voice production, assuring his readers that such knowledge is not dangerous,—may quite possibly be helpful!

Fortunately, Brodnitz agrees that sinuses are not vocal resonators, but he continues a traditional over-emphasis of other resonances with a reworded old fallacy, 'If we heard only the sounds the cords produce we would perceive a weak tinny voice, hardly audible at more than a few feet distance' (p. 36). A little experimentation with excised larynges or 'cushion-pipes' would provide considerably more respect than this for the acoustic energy of 'raw' puff-sounds as contrasted with that of vibrating strings.

Since 'The battlefield of the cold and of its complications are the vocal organs' (p. 109) [grammarians will find too many sentences with which to quibble], Brodnitz advises treatment of *conditions* rather than *symptoms*, emphasizing the need for rest and sensible diet, clothing, and living habits instead of reliance on drugs, gargles, and cough drops. Admitting his moderate indulgences, Brodnitz states that 'nicotine and alcohol (at least as a habit) are the avowed enemies of the speaker and singer' (p. 96).

Brodnitz commends today's less frequent removal of tonsils and points out several less well-known vocal sequelae of tonsillectomies. Infected adenoid rests may cause a constant drip of infected discharge. 'After removal of all infected adenoid rests and scar pockets [under general anesthesia], the patient will suddenly be freed of the frequent infections of larynx and windpipe' (p. 147). Enlarged *lingual* tonsils are 'frequently seen in patients who had tonsils and adenoids removed in childhood.' This enlargement is 'a source of chronic irritation,' forming a cushion at the base of the tongue which 'effectively damps the sound that emanates from the vocal cords. Persons who speak or sing with muffled or throaty voice should always be examined for enlargement of the lingual tonsil. It is a frequently overlooked condition.' Relatively simple surgical removal of this tonsil 'effects frequently a remarkable improvement in the quality of the voice' (p. 150).

Four pages of vocal cord photographs (Bell Laboratories) and an interesting discussion of laryngoscopy are somewhat outstanding.

Brodnitz welcomes the increasing number of speech therapists in the country, since so many vocal troubles diagnosed by laryngologists require retraining. He comments, however, 'The therapists are not much help either because they are so occupied with speech correction work that they do not pay enough attention to the disorders of the singing voice' (p. 188). Apparently our profession is not yet overcrowded!

Jack C. Cotton
State University Teachers College,
New Paltz, N. Y.

Valentine, C. W. *Parents and Children: A First Book on the Psychology of Child Development and Training.* New York: Philosophical Library, 1955. Pp. 212. $3.75.

The author, Emeritus Professor of Education in the University of Birmingham (England), intends the book primarily for parents whom he hopes to make less anxious by emphasis of 'the enormous range of individual differences among normal children.' He does succeed in reiterating the importance of these differences.

It is likely that the author's communication will suffer with American readers through the natural and frequent use of British idiom and terminology (*e.g.*, *infancy* refers to ages 2 to 5, *contra-suggestibility* to 'negativism').

To readers in this country many of the author's notions regarding 'orthodox' psychology and child rearing will also seem 'foreign,' not to say untenable. His consideration of individual differences deals almost exclusively with traits which he regards as instinctive or inborn—including a 'parental instinct' and inborn impulses for helping, love, anger, fear, self-preservation, protection of loved ones, and urge to mate, and intelligence as well. It may be that a raising of the nature-nurture controversy is purposely avoided; if so, evidence for environmental influence or for the importance of an interaction of inherited and experimental factors is, in the introductory and more theoretical chapters, skillfully avoided.

Methods of discipline directly or implicitly recommended which seem to counter advice offered by psychologists in this country are here presented in essence: to deal with temper tantrums, lock a 3½-year-old child in his room, a good punishment for a 4-year, 8-month-old child is to put him in the corner; rather than tell a young child that sex play is naughty, tell him it 'isn't nice'; don't tell adolescents that masturbation will lead to extreme physical and mental harm (since 'this has been found to be incorrect'), tell them it may 'lower their energies and spoil to some extent their later sex life'; as 'a gentle word of rebuke' for affectionate children, say, 'You are not my little girl if you do that.' Acceptance of the occasional need for 'caning' in the British public schools and discussion of coaching of children by parents and teachers in preparation for the taking of intelligence tests also appear sharply incongruous with present-day ideas in this country.

While the author has not professed to write a book for scientists and in this way tempers some objections we might have for a book which nevertheless professes to be, in part, scientific, it is disappointing that the information is not brought more up to date. While references to other authors are frequently incomplete (with no dates given), it appears that research beyond 1948 is not considered; most references are from late 1930 and early 1940. References to the author's earlier works and repetition of material within them is extremely frequent.

One part of the book proposes 'to give a general account of the normal child at various ages' and makes extensive and logical use of some of Gesell's data; then, as examples of normal development, the author uses primarily two of his own children whose 'intelligence quotients were found throughout this range of years to be consistently about 140 or more.'

The author with dispatch does away with at least two 'straw men': first, the assumption that all behavior is unconsciously motivated; second, that all firm discipline is harmful.

The discussion, at a popular level, of individual differences is a valuable contribution to parents' information, particularly so because of the consideration given to the often-neglected matter of intra-individual variation. Similarly, the presentation of 'readiness' concepts should also be helpful to parents.

Written in the first person in a completely informal and friendly manner with numerous anecdotes and personal references, this book by an experienced educator and practicing psychologist will likely be of considerable interest to its originally intended audience. It cannot be said to reflect philosophies of child development and training commensurate with recent theory and research.

DAN C. OVERLADE
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McCLELLAND, DAVID C. ed., *Studies in Motivation.* New York: Appleton—Century—Crofts, Inc., 1955. Pp. 552. $6.00.

In the continuing absence of any text containing a comprehensive treatment of the psychology of motivation, one stopgap alternative would be to compile in one place the most important fragmentary studies dealing with the topic. D. C. McClelland has attempted such a compilation. The result consists of fifty excerpted or reprinted articles of a predominantly empirical nature. The editor has made a deliberate effort to step out of what he calls the 'traditional framework' and in this he has succeeded, for many of the articles have little to do with motivation as it is usually conceived by psychological systematists. In fact, many of the authors are not psychologists at all, but representatives of such

fields as biology, sociology, anthropology, *etc.*, who have, in McClelland's eyes, something 'important to say about the springs of human action.' He has also tried to present a sampling of all the facts about motivation and here his effort is wide of the mark. It seems that in his zeal to break with tradition he has overlooked a great many facts about motivation which had the misfortune of being consonant with that tradition.

In such an amorphous field as motivation there is bound to be disagreement as to the particular set or selection which would best serve as introductory readings. In terms of the organization of the materials that have been included, however, McClelland has done an excellent job. Four major subdivisions include studies relating to psychodynamics (Freud, Murray, Rogers, *etc.*), the biological origins of motives (Tenbergin, Harlow, Miller, *etc.*), social origin of motives (Parsons, Max Weber, Riesman, *etc.*) and the effects of motivation on behavior (McClelland, Melton, Postman, *etc.*). Certainly, in terms of this organizational scheme, there is adequate room for materials covering the entire range of motivation. The difficulties of finding any sort of integration of such a range of topics are partially overcome by sometimes very subtle historical and thematic continuities from article to article and by selective emphasis on certain problems such as the relation of motivation to phantasy, the difficulties of a drive theory based on physiological needs, and the measurement of complex adult motives. The integration possible from these elements is incomplete at best and even the editor recognizes that the student might complete the readings with little more than a sense of infusion. But, he hopes, there will also be the impression that the field of motivation is a growing and significant one.

It seems to this reviewer that the positive goals of this collection could have been achieved without the danger of implanting a conviction of chaos in the reader if the materials had been selected more with an eye to broad requirements of an acceptable scientific construct of motivation. In eschewing 'simple theoretical schemes', the editor has also avoided discussion of what the term motivation might mean in any psychological theory. There is no reference, for example, to any of the provocative work of Koch on the logical status of the motivation construct. This in turn has led to a greatly reduced emphasis on the very empirical problems which Koch and others have eloquently pleaded should be the central focus of motivational psychology. There is very little material on the relation of motivation to response strength, on the known facts concerning drive discrimination, or on the basic relationships between drive and learning. There is also no reference to the studies using the Taylor Anxiety Scale, a series which was closely linked to consideration of the basic requirement of a motivation construct.

In spite of its shortcomings, there can be no doubt that this book will have wide use as the best single source of motivational references. It provides the first usable text-surrogate for courses in motivation and gives the general reader a stimulating overview of a most fascinating branch of psychology.

WALLACE A. RUSSELL
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KELLOGG, RHODA. *What Children Scribble and Why*. 570 Union Street, San Francisco, California, Author's Edition, 1955. Pp. 137. $2.50.

Over a five year period, Mrs. Rhoda Kellogg, Supervisor, Golden Gate Nursery School, San Francisco, collected 100,000 spontaneous drawings of her pupils. She analyzed the drawings of 300 children, two to four years old, for basic structural content. In *What Children Scribble and Why*, Mrs. Kellogg reports her findings.

After developing a rather elaborate classification system, the author catalogued the materials on the basis of their structural composition. The book attempts to identify these drawings and to indicate the developmental and sequential order of their appearance. She encountered considerable semantic difficulty in describing the productions of these pre-school artists. There has been no scientific terminology for children's art, but only such words as smear, scribble, smudge, design, or picture.

Pre-school art does have some order and sequence. It begins with scribbles and then progresses to what Mrs. Kellogg calls diagrams, combines, aggregates, the Mandals, radials, the human figure, and finally to other pictorial drawings. The author believes that suggesting to the child what or how to draw has the very worst possible influence on effective use of individual

creative ability in the arts. She thinks drawing ability is more closely related to chronological age than almost any other behavior. Throughout the book there are reproductions of scribbles and drawings to illustrate and verify the text.

Certain adult attitudes toward the child's efforts are questioned. Young children do not draw what they see in the environment but copy and develop their own random and accidental scribblings. Between ages two and four, they acquire most of the basic structural images with which they work from then on, as child and as adult.

Parents are also in error in assuming that the young child is trying to draw reality objects. If adults realized that children follow a developmental pattern of random and geometric forms, they would accept the child's natural method of drawing. The author contends that pre-school art has potential value as a means of better communication between children and adults.

Speech therapists, especially in a clinical situation, have been using art media as a part of the rehabilitative process. Many have used coloring, finger painting, and clay modeling as types of release therapy but often have not analyzed what the child had produced. Mrs. Kellogg has given a starting point for the interpretation of the content of the finished products. Speech therapists, especially those who deal with pre-school children, should find this book interesting and valuable.

Morris Val Jones
Morrison Center for Rehabilitation

Feingold, S. Norman, ed. *Words for Work, Handbook of Trade Terms for a Tutoring Program for New Americans.* Boston: Jewish Vocational Service of Greater Boston, 72 Franklin Street, Boston 10, Mass. Pp. 140. $1.00.

The use of word lists in the teaching of a language has been studied and debated frequently by linguists in recent years. Charles C. Fries in *English Word Lists* (p. 2) states that 'long experience lies behind the general belief that it is sound practice to attack the problem of learning a foreign language through a limited vocabulary of most useful words.' However, several problems arise in the selection of words and their compilation into lists. First of all, if mastery of a language is taken to mean learning all of the words of that language, then no native speaker could be said to have mastered his own language because many words exist which are unfamiliar to him, and the words he does know reflect his experience. In selecting a vocabulary for a particular learner, then, the teacher is faced with the difficult problem of predicting in some measure the student's future experience. Second, that there is exact equivalence of meaning between the words of different languages is sometimes assumed by the list compiler. This equivalence does not, in fact, exist, except perhaps in some technical words. Third, a list often takes into account only the lexical meaning of a word and ignores syntactical and morphological meanings and the meaning carried by sentence intonation and stress.

According to Fries (p. 63), Michael West classified vocabulary in his *Language in Education* as follows:

(1) *Essential words* which the the connective tissue of the language (about 300 in number);

(2) *General words* which are refinements of some of the essential words, e.g., *say* (essential) appears in the general words as *reply, question,* etc.;

(3) *Common environmental words,* such as *food, eat, sleep, house,* etc.; and

(4) *Specific environmental words,* such as *bison, sheep, reindeer.*

West advocates concentrating on words in Class 1, 2 and 3, because we cannot predict the learner's needs in Class 4.

The book discussed here contains Class 4 words to be used by a limited number of people in limited but predictable situations. It was designed for acquainting 'New Americans' from a German language background with 'basic job terminology for a particular trade.' It contains 174 general employment terms and lists of words commonly used by various tradesmen, such as carpenters, cabinet makers, machinists, painters, sheet metal workers, *etc.* Each English word is assigned a German equivalent.

'The trade terms for "Words for Work" were developed through the use of the "Dictionary of Occupational Titles, Volume I, Definition of Titles," 2nd Edition, 1949, U. S. Government Printing Office, Washington, D. C. In addition the terms used for each trade were gathered from other counselors working in voluntary commer-

cial and government agencies. Terminology used by employers in their job orders at the Jewish Vocational Service was another source of the words selected for each trade.'

The book was designed for use in job placement 'in dealing with persons of limited conversational English,' and is undoubtedly worthwhile for this specific purpose.

MARIAN WATSON
University of Minnesota.

Abstracts

Affedt, J. E., Dail, C. W., Collier, C. R. and Farr, A. F. Glossopharyngeal breathing: ventilation studies. *J. appl. Physiol.*, 8, 1955, 111-113.

In glossopharyngeal breathing, inspiration is accomplished by the pumping of air into the lungs with the muscular action of the tongue, cheeks, and pharynx, while exhalation is a passive process. To study the safety and adequacy of this type of breathing used as a substitute method of voluntary breathing for poliomyelitis patients, vital capacity and blood-gas measurements were obtained on seven patients. The writers conclude that glossopharyngeal breathing is a very useful and safe technique, and one which may have wider application to other conditions. (*I.E.H.*)

Atkinson, C. J. Supplementary Report No. 3. An estimate of the spectrum of body-conducted sidetone for the vowel /i/. SC contract DA-36-039, September 30, 1955, State University of Iowa.

The results of a series of studies designed to assess the spectrum and level of bone-conducted sidetone are presented. The method chosen involved a comparison of the threshold shifts produced by the voice with threshold shifts produced by random noise. Tables and figures of threshold shifts as functions of time and as functions of frequency are included for the voice as the stimulus and for noise as the stimulus. (*B.B.S.*)

Abstracts is edited by William Tiffany, University of Washington, assisted by the following committee: Asa J. Berlin, Pennsylvania State University; Virginia B. Carroll, Minneapolis Veterans Hospital; Frederic L. Darley, State University of Iowa; Clair N. Hanley, University of Washington; Inez E. Hegarty, Mt. Holyoke College; Parley W. Newman, Utah State Agricultural College; John J. O'Neill, Ohio State University; John M. Palmer, University of Washington; Maryjane Rees, Sacramento State College; Frank B. Robinson, Miami University; Vivian I. Roe, University of Indiana; Bernard B. Schlanger, Vineland (N. J.) Training School; George H. Shames, University of Pittsburgh; Joseph G. Sheehan, University of California; Barbara S. Street, Minneapolis Veterans Hospital; Wayne L. Thurman, Eastern Illinois State Teachers College.

Barton, R. T. The clinical significance of the ridge of Passavant. *Int. Abstr. Surg.*, 101, 1955, 317-320.

Following 32 dissections of the nasopharynx and oropharynx, the author concludes that (1) the ridge of Passavant is an important physiologic component of the nasopharyngeal sphincter; (2) the structure is formed in the mucosa of the posterior pharyngeal wall as a result of the active constriction of the upper and inner horizontally disposed fibers of the superior constrictor muscle; (3) the nasopharyngeal sphincter is formed by the levators pulling the palate upward and back, by the palatopharyngeus pulling lateral pharyngeal walls inward, and by the ridge of Passavant bulging anteriorly from the posterior pharyngeal wall; (4) because of its importance in articulation and deglutition, this area should be subjected to a minimum of trauma if post-operative speech and swallowing difficulties are to be avoided. (*F.L.D.*)

Campbell, E. J. An electromyographic examination of the role of the intercostal muscles in breathing in man. *J. Physiol.*, 129, 1955, 12-26.

The function of the intercostal muscles in human respiration was studied electromyographically on a group of men and women subjects. Among the significant findings were the following: (1) the intercostal muscles contract between the lower ribs (sixth, seventh, and eighth), especially in inspiration, (2) posture is an important factor in the contraction of the intercostals during inspiration, (3) no data is found to support the concept of antagonistic functioning of the internal and external intercostals, and (4) the intercostal muscles facilitate voluntary expiration. (*I.E.H.*)

CONWAY, H. and STARK, R. B. Pharyngeal flap procedure in the management of complicated cases of cleft palate. *Ann. Surg.*, 142, 1955, 662-673.

The authors present three basic rationales regarding cleft palate management: (1) those who advocate artificial vela; (2) surgeons who developed technics for lengthening the soft tissues of the palate; and (3) surgeons who devised technics to move the posterior pharyngeal wall forward. The authors report the results of management of 517 cleft palate cases over a 20-year period at the New York Hospital-Cornell Medical Center. Eighty-one of these had faulty speech despite adequate speech therapy.

On 51 of these 81 cases the pharyngeal flap operation was performed alone (four flaps based superiorly, 47 inferiorly), while on 30 cases the pharyngeal flap operation was combined with push-back procedures. Sixty-four of the 81 cases (79%) exhibited normally acceptable speech following this surgery. Experience has led to the authors' conclusion that the pharyngeal flap operation is most effective when based inferiorly and when combined with the push-back operation. (*F.L.D.*)

DELATTRE, P. C. LIBERMAN, A. M., and COOPER, F. S. Acoustic loci and transitional cues for consonants. *J. acoust. Soc. Amer.*, 27, 1955, 769-773.

Experimental evidence has shown that second-formant transitions are cues in the perception of stop and nasal consonants. This study is concerned with providing further evidence for the existence and positions of the second-formant loci for the [b], [d], and [g]. 'The results of these experiments indicate that, for the voiced stops, the transition cannot begin at the locus and go from there to the steady-state level of the vowel. Rather, if we are to hear the appropriate consonant, the first part of the transition must be silent. The voiced stops are best synthesized by making the duration of the silent interval equal to the duration of the transition itself.' (*C.N.H.*)

DENES, P. Effect of duration on the perception of voicing. *J. acoust. Soc. Amer.*, 27, 1955, 761-764.

This investigation was carried out to measure the effects of one of the non-spectral physical characteristics of the speech wave on the recognition of voicing. In a preliminary study, the author interchanged the final consonants from the words [jus] and [juz]. In order to make this exchange it was necessary to adjust the durational characteristics of the consonants so that the shorter [z] and the longer [s] were either lengthened or shortened so as to substitute properly for the replaced sound. The results of this study clearly indicated that the original [s] when shortened sounded like an acceptable voiced [z]. For a more elaborate investigation of this finding the [s] sound, of four different durations, was attached to a synthesized syllable [ju] in which the vowel duration was also systematically varied. Observer recognition showed that the duration of the vowels and of the final consonants has a definite and consistent influence on the perception of voicing. It was noted that the recognition of the [s] as a [z] decreases steadily as the ratio between the duration of the [s] to the [u] increases. The author cautions that this is probably just one of many cues used by the listener in voicing recognition. (*C.N.H.*)

FRY, D. B. Duration and intensity as physical correlates of linguistic stress. *J. acoust. Soc. Amer.*, 27, 1955, 765-768.

'The experiments reported in this paper are an attempt to explore the influence of certain physical cues on the perception of linguistic stress patterns.' Five common English words which are assumed to change from noun to verb with a change in stress pattern were chosen for study. Spectrograms were made of the selected words and vowel durations and intensities were measured for the two vowels in each word for 12 talkers. The Haskins pattern playback was employed to synthesize the stimulus words in which the vowel duration and intensity ratios were systematically varied. Thirty-three listeners were asked to indicate for each word whether it was the noun form or the verb form. Results indicated that when the vowel was long and of high intensity observers agreed that it was strongly stressed. When it was short and of low intensity it was judged to be weakly stressed. It was shown that the durational variable is more significantly related to the recognition of stress than is the intensity variable. (*C.N.H.*)

HILGER, J. A., GOLTZ, N. F., KUSSKE, D. R. and KUSSKE, B. W. Carcinoma of the pharynx, larynx and cervical esophagus. *J. Lancet.*, 74, 1954, 1-6.

This article reviews the sites of occurrence and the symptoms of carcinoma. It stresses the importance of early diagnosis and surgery as the only means of therapy. A strong appeal is made for esophageal speech training and credit is given this practice for the removal of psychological trauma following laryngectomy. (*J.M.P.*)

KESSLER, H. E. Speech as related to dentistry. *Dental Radiog. Photog.*, 28, 1955, 41-45.

'This article lists the dental causes of speech defects and shows how the dentist can often help to overcome these difficulties.' Briefly described are malocclusions, missing teeth, prognathism, temporomandibular ankylosis, dentures and bridges, tongue-tie, cleft palate, and shortness of soft palate. Eleven color photographs are included. (*W.R.T.*)

MEYER-EPPLER, W. and LUCHSINGER, R. Beobachtungen bei der verizögerten rückkopplung der sprache (Lee-Effekt). *Folia phoniatr., Basel*, 7, 1955, 87-99.

The authors studied three effects on speech produced by listening to an 85 ms. delayed auditory feed-back: '(1) The increased difficulty of logical thought, as expressed in contaminations, repetitions and difficulty in finding words. (2) The parasitic sounds introduced into speech. (3) Pitch changes, and the leveling out of the variations in amplitude and frequency (vibrato) characteristic of the singing voice. The speech disturbances listed under (1) and (2) are characterized as a form of externally conditioned cluttering.' (*A.J.B.*)

MOSER, H. M., DREHER, J. J. and ADLER, S. Comparison of hyponasality, hypernasality, and normal voice quality on the intelligibility of two-digit numbers. *J. Acoust. Soc. Amer.*, 27, 1955, 872-874.

Six male speakers, judged to employ Eastern and General American dialects, recorded random lists of two-digit numbers simulating hyponasality and hypernasality and with normal voice quality. These recorded lists were presented to a panel of 11 trained listeners at two S/N ratios, -12 and -15 db. Analysis of variance procedures showed that mean articulation scores for normal, hyponasal, and hypernasal methods differ significantly at each of the two S/N rations. For the -12 db condition, normal quality is shown to be significantly better than either of the other two conditions of voice quality, whereas at the -15 db ratio normal and hyponasal speech was significantly better than hypernasal speech but not different from each other. The authors speculate that the addition of extra resonance regions into the vowels apparently interferes with the listener's ability to differentiate between speech sounds regardless of the overall effect on the intensity of the sounds. (*C.N.H.*)

SAPORTA, S. Frequency of consonant clusters. *Language*, 31, 1955, 25-30.

The author postulates that in any consonant cluster the situation of least effort for the speaker is that in which successive phonemes are most similar while the optimal situation for the listener is that in which the phonemes of a cluster differ as much as possible. An analysis was made of texts in colloquial English and substandard Mexican-Spanish. The results seem to indicate that the frequency of consonant clusters is equally divided between maximum effort for speaker and listener. (*J.J.O.*)

SCHUBERT, E. D. Basic research in psychoacoustics, Third quarterly progress report, April 1—June 30, 1955, SC contract DA 36-039 SC -63144, SC Project 132B. DA Project 3-99-12-022, State Univ. of Iowa.

This progress report on research in the psychoacoustics of speech summarizes activities in three main tasks. These are: (1) continued investigation of sidetone embracing measurements of body vibration during speech, and of non-air-conducted sidetone, (2) continued investigation of amplified sidetone, and (3) projects involving the completion and evaluation of an audiospectrometer and the possible increase in intelligibility accompanying certain binaural time difference. (*B.B.S.*)

SMITH, A. A., MALMO, R. B., and SHAGASS, C. An electromyographic study of listening

and talking. *Canad. J. Psychol.*, 8, 1954, 219-227.

'Twenty-two psychiatric patients and 11 normal controls listened to a faulty sound recording. They were later asked to tell what they remembered of the record, and to report their feelings. EMGs from five muscle groups were recorded. Results were: (1) During listening, rising and falling gradients of tension were observed in speech muscles, and in extensor muscles of both arms, (2) All muscles studied showed significant increases in tension with talking, (3) Differences between patients and controls were seen only in speech muscles, and then chiefly during questioning about feelings.' (Author's precis)

Spieth, W. and Webster, J. C. Listening to differentially filtered competing voice messages. *J. acoust. Soc. Amer.*, 27, 1955, 866-871.

'An attempt was made to improve listeners' ability to respond to one of two or more simultaneous or overlapping voice messages by differentially filtering the competing message channels.

The limits of satisfactory intelligibility of two digits and two International Civil Aeronautics Organization (ICAO) phonetic alphabet words in a message also containing an address were determined under various conditions of high- and low-pass filtering and speech-to-noise ratios (S/N). Within these limits, several amounts of filtering were tried in various combinations.

When performance on differentially filtered competing messages was compared with performance on unfiltered competing messages, it was found that differential filtering almost always improved performance. This was true regardless of whether it was the desired message that was filtered or whether it was one or more of the competing messages that was filtered, and the degree of filtering was relatively uncritical. High-pass cutoffs of 565, 800, or 1130 cps were about equally effective and were considerably better than high-pass cutoffs at or below 280 cps. Low-pass cutoffs of 1600, 1130, and 800 cps also improved performance substantially.' (Author's precis)

Steer, M. D., Asher, J. W. and Hanley, T. D. A field study of voice communication problems as related to training devices, procedure and equipment. Tech. Report SPECDEVCEN 104-2-41, Project 20-F-8, April 13, 1955, Purdue University.

A survey of Navy personnel charged with communication duties was undertaken to secure data on voice communication systems in use as well as to determine the scope of existing communication problems. Major sources of difficulty pointed out by all personnel were inadequate training, nonstandardized communication procedures, inefficient use of equipment and lack of proper supervision. Recommendations based on experience are given for increasing the efficiency of Navy voice communications. (*B.B.S.*)

Steer, M. D., Doty, L. and Hanley, T. D. A study of type and frequency of communication messages aboard naval vessels. Tech. Report SPECDEVCEN 104-2-42, Project 20-F-8, April 13, 1955, Purdue University.

Recordings of messages transmitted during actual naval operations were analyzed to determine the efficiency of voice communication systems aboard naval vessels. Results indicated that approximately 30 per cent of the total number of messages in the sample contained information which did not contribute to the efficiency of naval operations and also which interfered with communications by making channels unavailable for essential messages. Several suggestions are offered for markedly increasing the efficiency of voice communications. (*B.B.S.*)

Weibel, E. S. Vowel synthesis by means of resonant circuits. *J. acoust. Soc. Amer.*, 27, 1955, 859-865.

Techniques of creating artificial vowels by means of the filterbank vocoder, the Fourier series, the electrical vocal tract, the resonance vocoder, and by phonetic elements are discussed and compared as to their coding efficiency. A new method of vowel synthesis by means of resonant circuits is described in detail. The ability of this resonance synthesizer to produce vowels was tested by comparing the results with the electrical vocal tract. The degree of agreement by the two methods is extremely high. The author states that the vowels produced by the resonance circuits sounded 'very realistic.' (*C.N.H.*)

BARON, S. H. Preservation of hearing in mastoid surgery: technical considerations. *Trans. Amer. Acad. Ophthal. Otolaryng.*, 59, 1955, 385-398.

The author describes his surgical technic which has the following objectives in the preservation of hearing acuity: (1) to maintain mobility of the stapes in a sealed tympanic space with continuity between the eustachian tube and the round window, (2) to prevent obliteration of this sealed tympanic space, and (3) to ensure contact between the tympanic membrane and the head of the stapes when the incus or the incus and the head of the malleus have been removed. Good hearing levels persist usually as a result of this surgery; if not, the author states that the Lempert nov-ovalis fenestration operation will generally succeed in preserving good hearing levels. (*J.M.P.*)

BÉKÉSY, G. V. Human skin perception of traveling waves similar to those on the cochlea. *J. acoust. Soc. Amer.* 27, 1955, 830-841.

Traveling waves on the membrane of a dimensional model of the mechanical parts of the human cochlea were observed under stroboscopic illumination. Maxima of vibration were observed to shift from one end of the model to the other when the frequency was increased from 40 cps to 160 cps. The author points to the sharp localization in spite of the flat distribution of vibrations along the membrane. He suggests that this localization is produced by the inhibitory effects of the skin. 'Some basic relations between nerve density on the cortex, threshold, and loudness increase on the skin are pointed out in the hope that they will later enable us to determine the differences between the organ of Corti and the simple skin membrane. This would be helpful to our understanding of the nature and function of the complicated structure of the organ of Corti. On the whole, in the observation of pitch of pure tones, this simple skin-model is as useful as the organ of Corti itself. The differences become apparent only in the observation of more complex sounds.'

(*C.N.H.*)

BENTZEN, O. and JELNES, K. Incidence of impaired hearing in Denmark. *Acta Otolaryng.*, 45, 1955, 189-197.

This survey was conducted on a questionnaire basis. One thousand five hundred and sixty hospitalized patients, in three hospitals, were questioned as to the social adequacy of the hearing of members of their families. This allowed for information on 5000 subjects. The distribution of the sample, in terms of age, sex, residence and occupation closely followed that of the entire population. The individuals who had been described as having hearing problems were administered audiometric tests. The test results indicated that 301 individuals, or 6 per cent of the population, had severely impaired hearing. Sixty per cent of the losses were of a perceptive nature. (*J.J.O.*)

EGAN, J. P. Independence of the masking audiogram from the perstimulatory fatigue of an auditory stimulus. *J. acoust. Soc. Amer.*, 27, 1955, 737-740.

'The loudness of a steady auditory stimulus declines during the first few minutes of the application of that stimulus. This decrease in loudness is so great that it is important to know whether or not the masked threshold also changes during the initial period of stimulation. In the present investigation the degree of perstimulatory fatigue and the amount of masking were both determined for the same stimulus. It is shown that the masked threshold is essentially independent of the duration of the masking stimulus.' (Author's precis)

FISCH, L. Deafness in cerebral-palsied school children. *Lancet*, 269 (6886), 1955, 370-371.

The author reports a survey of three 'different types' of schools for the cerebral palsied child. Audiometric examinations of 89 cases indicate that 20 per cent have hearing losses of 'handicapping degree.' She reports that screening tests, as usually administered, are not satisfactory for this type of case, that commercial earphones are too large and bulky, and that there is a need for audiometric evaluations for every cerebral palsied child. (*J.M.P.*)

HARFORD, E. R. and MARKLE, D. M. The atypical effect of a hearing aid on one patient with congenital deafness. *Laryngoscope*, 65, 1955, 970-972.

A case is reported in which apparent traumatic hearing loss may have resulted from a hearing aid worn by an eight year old girl with congenital perceptive deafness. The authors caution the reader 'against interpreting the report as evidence supporting the concept that hearing aids may cause damage to the ear.' (*W.R.T.*)

Kos, C. M. Auditory function as related to to the complaint of dizziness. *Laryngoscope*, 65, 1955, 711-721.

The concurrence of dizziness and certain measures of auditory function is discussed for labyrinthine hydrops, labyrinthine ischemia, labyrinthine apoplexy, and acoustic neuroma. The author points out that 'audiometry and audiology are essential to those who undertake the responsibilities of managing the complaints of otologic origin or expression such as dizziness.' (*W.R.T.*)

Lundborg, T. Nerve deafness for low tones. *Acta Otolaryng.*, 45, 1955, 215-225.

The case histories and audiograms of eight cases of nerve deafness for low tones are reviewed. Nerve deafness for low tones is defined as a hearing loss of at least 20 decibels in the frequency range below 2000 cps. It is concluded that the losses are due to retrocochlear difficulties.

(*J.J.O.*)

Mathes, R. C. Monaural direction finding. *J. acoust. Soc. Amer.*, 27, 1955, 792.

This is a letter to the editor regarding an experiment in monaural direction finding. The author states that during World War I he was suddenly 'completely deaf in one ear (fortunately temporarily).' The physician to whom he reported conducted the following experiment: The subject was thoroughly blindfolded and placed in the center of a circle of about 15 feet in radius and a good distance from any reflecting object. The physician produced a short 800 cps tone and asked the subject to point to the source. The doctor then moved his position and repeated the procedure. Later, a click-like tone produced by striking two stones together, was used as the stimulus. The results showed that direction finding for the tone was quite poor, but for the clicks, the subject was fairly successful. The writer attributes the difference in success to the change in quality of the complex tone (clicks) as a result of the shadowing effect of the head. (*C.N.H.*)

Palva, T. Studies of hearing for pure tones and speech in noise. *Acta Otolaryng.*, 45, 1955, 231-243.

Sixty-seven ears of hard of hearing subjects were tested during this study. Pure tone thresholds were measured in a thermal noise of 95 decibels. The noise was interrupted 12 times per second. Speech reception thresholds and discrimination thresholds were also measured in 95 decibels of continuous thermal noise. In the instance of pure tone testing the test results indicated that there was no clear-cut differentiation between cases with conductive and perceptive type hearing losses. Also there were no differences between the recruiting and non-recruiting cases. Speech reception thresholds were normal for each of the groups (at speech-to-noise ratios from +2 to +5). The cases of perceptive loss showed a definite lowering of discrimination scores, but not significantly so from the scores for the conductive type cases.

(*J.J.O.*)

Palva T., and Ojala, L. Middle ear conduction deafness and bone conduction. *Acta Otolaryng.*, 45, 1955, 137-152.

The authors discuss the concept that lowered bone conduction values may sometimes be attributed to a restriction of the oval and round windows and not to lowered cochlear or nerve function. An audiometric study was made of the relation between air and bone conduction thresholds in catarrhal and suppurative middle ear inflammation. The studies were made before and after drainage of the middle ear. The bone conduction thresholds remained the same, essentially normal, after drainage. However, there was improvement in some cases for the bone thresholds for the lower frequencies. The results appear to indicate that restricted movement of the round and oval windows can be responsible for lowered bone conduction thresholds.

(*J.J.O.*)

Sandel, T. T., Teas, D. C., Feddersen, W. E. and Jeffress, L. A. Localization of sound from single and paired sources. *J. acoust. Soc. Amer.*, 27, 1955, 842-852.

Various pure tones were presented, either singly or paired from two loudspeakers, to listeners who used an acoustical 'pointer' to indicate the direction of the stimulus. This 'pointer' was a small loudspeaker which produced a wide-band noise and which could be rotated about a vertical axis through the subject's head. 'The results of the three experiments support the conclusion that the localization of tones below about 1500 cps is determined largely by interaural time differences. For frequencies above 1500 cps, differences of intensity at the two ears must be the dominant factor, but neither probe microphone measurements nor audiograms for the subjects provided information from which satisfactory predictions could be made.'

(*C.N.H.*)

SCHUBERT, E. D. and PARKER, C. D. Addition to Cherry's findings on switching speech between the two ears. *J. acoust. Soc. Amer.*, 27, 1955, 792-793.

This study is concerned with the effects of switching speech signals between the two ears on the intelligibility of that speech. A further ramification of this procedure was the introduction of random wide-band noise during the interval that no speech signal was reaching the ear. The findings show a marked dissimilarity between the intelligibility scores obtained with the noise and silence. The intelligibility scores for the noise variable show a gradual decrement from about 87 per cent for the slow switching rate to about 77 per cent for the faster rates. During the readings unaccompanied by noise the intelligibility level declined much more markedly as the switching rate was increased up to about 4 per second. This was followed by an increased intelligibility with further increases in switching rate to the level reached by the noise curve. The authors offer tentative hypotheses regarding their results but caution that a more adequate hypothesis will be forthcoming only after further research in this area. (*C.N.H.*)

SMALL, A. M., JR. Some parameters influencing the pitch of amplitude modulated signals. *J. acoust. Soc. Amer.*, 27, 1955, 751-760.

'The rise-fall time, duty cycle, and carrier frequency of a pulsed tone were systematically varied. Listeners matched the pitch of this signal to that of a sinusoidal comparison tone. Low SPL was used throughout. Two pitches were identified, one corresponding to the repetition rate (periodicity pitch), and the other to the carrier frequency (carrier pitch). The periodicity pitch decreased in audibility with the increase of any of the experimental variables. These variables had the opposite effect on the perception of the carrier pitch, which in general was audible only at the longer duty cycles. Individual listeners varied considerably in their ability to match the pitch of pulsed tones. Comparison of the results obtained with pulsed sinusoids to those of pulsed noise suggest that the perception of a periodicity pitch depends upon the band width and spectral location of the pulsed signal's frequency components as well as envelope wave form fluctuation.'

(Author's precis)

STEVENS, S. S. Decibels of light and sound. *Phys. Today*, 8, 1955, 12-17

The author proposes that the decibel scale be used to describe the intensity of light and that the visual counterpart to the sone be the 'bril.' 'Not only is the decibel a computational convenience, but its use in psychophysics makes it easier to describe similarities and differences between the senses.' (*J.M.P.*)

STEVENS, S. S. The measurement of loudness. *J. acoust. Soc. Amer.*, 27, 1955, 815-829

The author reviews the available evidence on the relation between loudness and intensity and equations are suggested for deriving loudness as a function of intensity. 'At low levels of intensity, the loudness of white noise grows more rapidly than the loudness of a 1000-cycle tone, but above the level of approximately 50 db the two loudnesses remain more nearly proportional. The suggestion is made that for all levels greater than 50 db the loudness of continuous noises may be calculated from the equation: $\mathrm{Log}L = 0.03N+S$, where S is a spectrum parameter to be determined empirically.' (*C.N.H.*)

STRANGE, P. The sense of pitch and local increase in threshold. *J. Physiol.*, 129, 1955, 225-236.

The purpose of this experiment was to study the effect of intensity on pitch for

subjects with slight hearing loss. Thirteen subjects with slight loss between 3000 and 6000 cps were asked to make a series of judgements concerning the relative pitch level of two tones. Various frequencies were presented at varying degrees of intensity through an electroacoustic system. One of the major findings was that for individuals with a slight hearing loss pitch was modified by intensity within the range of the hearing loss. The direction of pitch change was not consistent for different individuals nor for different frequencies in the same ear. (*I.E.H.*)

THOMASEN, K. Employment of impedance measurements in otologic and otoneurologic diagnostics. *Acta Otolaryng.*, 45, 1955, 159-167.

The impedance measurement involves a comparison of the unknown acoustic impedance of an individual ear with a known variable impedance by means of an acoustic bridge. The author discusses the application of the impedance measuring technique in the diagnosis of conductive hearing losses and psychogenic hearing losses. The technique also offers a means of objectively measuring recruitment. Included is a listing of diagnostic signs and norms. (*J.J.O.*)

THWING, E. J. Spread of perstimulatory fatigue of a pure tone to neighboring frequencies. *J. acoust. Soc. Amer.*, 27, 1955, 741-748.

The spread of perstimulatory fatigue (*i.e.*, the decline in loudness of a steady auditory stimulus) to surrounding frequencies was measured by employing a 1000 cps test tone at 80 db and comparison tones of 100, 300, 600, 800, 1000, 1200, 1600, 2000 and 2500 cps. Observers made simultaneous dichotic loudness balances in test runs which were composed of a pre-fatiguing balance, four per-fatiguing balances, and two post-fatiguing balances. It was found that maximum fatigue is produced at the level of the fatiguing tone and that the effect declines rapidly and symmetrically on both sides of this frequency. 'It is also clear that the greater the magnitude of fatigue the longer it takes for it to reach maximum. Those frequencies (100 and 2500 cps) which are a considerable distance from the fatiguing tone have reached what appears to be maximum within the first minute after onset of the fatiguing stimulus. At the other extreme, maximum fatigue, measured at 1000 cps, is not attained until three or more minutes after the onset of the stimulation.' (*C.N.H.*)

WEVER, E. G. and LAWRENCE, M. Patterns of injury produced by overstimulation of the ear. *J. acoust. Soc. Amer.*, 27, 1955, 853-858.

This study, carried out on guinea pigs under deep anesthesia, investigated the effects of injury by overstimulation employing various pure tones. Cochlear potentials recorded from the round window were plotted for 11 tones over the range of 100 to 10,000 cps. For each tone investigated, intensity was systematically varied until a departure from linearity of response (microvolts at the round window) occurred. Following the derivation of these intensity functions, the ear was overstimulated with a selected tone until an injury was produced as shown by a reduction in the response to this tone. After this period a delay time of one hour was interposed to allow for recovery and then the first procedure was repeated for all 11 tones. 'The results showed general impairments of the responses after such injury. With rare exceptions, the maximum responses to any tone are much less impaired than the sensitivity, and the maximums are more seriously affected for the low tones. In general, these changes are independent of the frequency of the tone producing the injury.' (*C.N.H.*)

WOELLNER, R. C. and SCHUKNECHT, H. F. Hearing loss from lesions of the cochlear nerve: an experimental and clinical study. *Trans. Amer. Acad. Ophthal. Otolaryng.*, 59, 1955, 147-149.

The effect on hearing of partial sectioning of the cochlear nerve in cats was studied and related to findings of hearing loss in two patients having acoustic neurinomas. It was found that 'more than 75 per cent of the spiral ganglion cells must be lost in a particular region of the cochlea before there is a threshold elevation for frequencies having their fields of excitation in those regions.' The authors conclude that 'a small number of cochlear nerve fibers are adequate to conduct an impulse of threshold magnitude, but that greater numbers of nerve fibers are needed to con-

duct the complex neural patterns of speech.' (*J.M.P.*)

AUSTIN, G. M. and GRANT, F. C. Physiologic observations following total hemispherectomy in man. *Surgery*, 38, 1955, 239-258.

Four cases of right-sided total hemispherectomy (with exception of thalamus and hypo-thalamus) in adults are reported. Psychologic studies showed relatively little memory change, and intellectual capacity for concrete facts remained good. There was considerable increase in the latency of response to questions in psychological testing. The most marked changes were in the realm of perceptual thought. No aphasia is reported in any of the four cases. Other data concerning recovery of motor function on the left side, electroencephalograms, and sensations of pain and touch are presented. (*F.L.D.*)

DAVENS, E. Services to crippled children. *Children*, 2, 1955, 139-144.

Developments during the past 20 years in the care of handicapped children are reviewed in a compilation from the comments of directors of State crippled children's programs. The feeling prevails that these programs are still in a stage of dynamic growth. One of the basic principles in the underlying philosophy of a program of medical services is that the effectiveness of a State crippled children's program depends upon the degree to which its activities are correlated and integrated with the medical and allied professional groups.

The most consistent trend nationally is said to be the broadening of the definition of a crippling condition, with the team approach the dominant trend at the moment in organization of services. Concern is expressed by the program directors about the increasing numbers of children requiring custodial care or institutional types of habilitation services caused by the survival of severely disabled infants. (*B.B.S.*)

ETTLINGER, G., JACKSON, C. V. and ZANGWILL, O. L. Dysphasia following right temporal lobectomy in a right-handed man. *J. Neurol. Neurosurg. Psychiat.*, 18, 1955, 214-217.

The authors report a case of primarily receptive dysphasia following a right temporal lobectomy for temporal lobe seizures in a right-handed man. They postulate such a finding may occur in individuals showing familial left-handedness or congential weak right-handedness. They state existing evidence does not make the bilateral representation of speech a tenable hypothesis at present. (*V.B.C.*)

FRENCH, L. A., JOHNSON, D. R., BROWN, I. A., and VAN BERGEN, F. B. Results of cerebral hemispherectomy. *Mod. Med.*, 23 (13), 1955, 112.

Cerebral hemispherectomies were performed on nine patients suffering from uncontrollable convulsive seizures. Post-operative EEG's revealed great improvement. Motor function returned to pre-operative levels, speech was not altered, and no loss of intellectual function was detected. The post-operative course of seizures was recorded for eight of the nine patients. In four patients, no post-operative seizures were observed; three were continued on small doses of anticonvulsant medication. Another patient died 52 weeks postoperatively after a 90% reduction in seizures.

(*B.S.S.*)

HOOD, P. N. and PERLSTEIN, M. A. Infantile spastic hemiplegia. *Amer. J. phys. Med.*, 34, 1955, 457-466.

The results are presented of a study of 334 infantile spastic hemiplegics, 149 left and 185 right. In contradistinction to previous reports in the literature, no significant differences were found between the two groups with regard to sex distribution, presence of seizures, whether congenitally or post-natally acquired, rate of language and motor development, intelligence, and birth-weight, except for greater incidence of right hemiplegics and a heavier mean birth-weight for right hemiplegics. Theoretical considerations leading to the belief that damage to the left or presumably dominant hemisphere is more devastating to the general functioning of the individual than equal damage to the right hemisphere are not supported by the data of this study.

(*F.L.D.*)

HOWELL, D. A. Unusual centrencephalic seizure patterns. *Brain*, 78, 1955, 199-208.

The author describes cases of centrencephalic epilepsy in which minor motor, sensory, automatic, and psychical seizures

occurred. In these cases, the patients suffered little impairment of consciousness or amnesia for the attack. These attacks were intermediate in severity between larval electroencephalographic seizures and petit mal. Twelve cases in which patients experienced an arrest of speech during minor seizures are described and the mechanisms involved in such attacks are discussed. Several possible explanations of the resemblance of these unusual patterns of attacks to focal cortical seizures are offered. (*B.S.S.*)

LORENZE, E. J. and CANCRO, R. Role of nondirective play therapy as a technic of psychotherapy in cerebral palsy. *Arch. phys. Med.*, 36, 1955, 523-529.

Ten children with cerebral palsy considered to have psychological problems resulting in specific behavior problems or speech retardation were placed on a program of play therapy. Improvement was noted in the behavior or speech of eight, no improvement was noted in two. The authors' impression is that children with emotional disturbances who have been on play therapy have made greater improvement in behavior, speech, and cooperation with therapists than those who have not had the benefit of psychotherapy. (*F.L.D.*)

PERLSTEIN, M. A., GIBBS, E. L., and GIBBS, F. A. The electroencephalogram in infantile cerebral palsy. *Amer. J. phys. Med.*, 34, 1955, 477-495.

An electroencephalographic study was made of 1217 consecutive patients with infantile cerebral palsy. The results were: (1) Of the total cerebral palsy population, 90% were either spastic or athetoid, spastics outnumbering athetoids (3:1); (2) Males predominated over females (58:42) except for spastic paraplegics, in which group females predominated (53:47); (3) Deafness was common in athetoids, as compared to spastics; (4) Seizures occured in nearly one-half of all patients with cerebral palsy; (5) The most common types of clinical seizures were grand mal and the focal or jacksonian, and the least common types were petit mal and psychomotor; (6) Very abnormal electroencephalograms occured in 90% of cerebral palsy patients with a history of seizures and in 44% of those without seizures. Abnormal EEG's were more frequently seen in spastics than in other forms of cerebral palsy; and (7) Electroencephalographic findings changed with age, the greatest number of abnormal EEG's occurring in the 4-6 year age group. Other details concerning types of patterns, asymetries, and foci are reported. (*F.L.D.*)

SHAPIRO, M. B. An experimental investigation of the block design rotation effect: an analysis of a psychological effect of brain damage. *Brit. J. med. Psychol.*, 27, 1954, 84-88.

The author concludes that the general dysfunction sometimes produced by brain damage results from the inhibition of a large number of incoming sensory cues. The negative or inhibitory aspects of attention are often intensified in brain-damaged subjects. Three laws of organization of the visual field affecting block rotation are discussed. By manipulation of the material and visual fields, predicted effects similar to those seen in brain-damaged subjects were produced in normal subjects. Alternative theoretical explanations are evaluated by the author. (*J.G.S.*)

WEINSTEIN, S. Time error in weight judgment after brain injury. *J. comp. physiol. Psychol.*, 48, 1955, 203-207.

Second in a series of experiments on tactile size and weight judgements by patients with brain injury, the present study utilized the same four groups of subjects: brain-injured veterans with sensory loss in the affected hand, brain-injured adults with paralysis of one hand without associated sensory loss, adults with peripheral nerve injury to one hand, and adults with peripheral nerve injury to one leg. The subjects' supinated hands were stimulated by two solid cylinders. Unilateral and bilateral stimulation were given at varying time intervals. The author found that all subjects over-estimated the time intervals, especially with unilateral stimulation (either hand alone). Patients with parietal lobe lesions showed greater over-estimates in these judgements than other brain-injured patients or the control group. (*I.E.H.*)

WEINSTEIN, S. Time error in tactile size judgement after penetrating brain injury. *J. comp. physiol. Psychol.*, 48, 1955, 320-323.

Similar in design to previous experiments in this series of tactile size and weight judgements by brain-injured patients, this study of time error in tactile size judgement by the same four groups of subjects found that all subjects over-estimated the time intervals. Unilateral judgements exceeded bilateral stimulation in over-estimated judgements. There was no difference in judgements between hands with and without sensory loss although patients with frontal lobe lesions over-estimated to a greater degree when bilateral stimulation was presented. (*I.E.H.*)

Wood, N. E. A comparison of right hemiplegics with left hemiplegics in visual perception. *J. clin. Psychol.*, 11, 1955, 378-380.

On the hypothesis that damage to the left or right hemispheres of the brain may produce differences in integrated mental activities, the author tested visual perception with 50 right and 36 left spastic hemiplegics. The age range was 10 to 30 years. All subjects were screened for aphasia, hearing loss, and/or severe speech problems. The two groups were found comparable in significant areas, then tested for visual acuity and grouped according to good and poor vision. The tests used were: (1) figure-ground relationships, (2) Street's perceptual closure test, and (3) an adaptation of Harrower's test for visual perseveration. Significant differences between the two groups were not found although there was a suggestion of greater perseveration found in the group of left hemiplegics with poor vision. (*V.B.C.*)

Albino, R. C. Defenses against aggression in the play of young children. *Brit. J. med. Psychol.*, 27, 1954, 61-71.

'1. The behaviour of a group of preschool children in a partly restricted play situation was fully recorded, each child being interviewed individually. 2. The aggressive episodes in the records were analysed to determine the form of their termination. 3. It was found that the observed terminations to the aggressive episodes could be regarded as defenses against aggression.' (Author's precis)

Altman, Y. Readiness for first grade. *Amer. Childh.*, 40 (7), 1955, 24-26.

This is one of a series of articles based on experiences the author has had in preparing children for first grade. Two steps in this process are training in accurate enunciation and pronunciation and training in problematic thinking. Liaison between teacher, parent, and speech teacher is discussed. If no speech teacher is available, the kindergarten teacher and parent study the child's needs and work them out together. Confusion in mechanics and comprehension of reading may develop if the speech defect is not corrected by first grade. A list of activities designed to improve problematic thinking and thus help in the reading process is included. Suggestions for projects and motivating devices are illustrated. (*B.B.S.*)

Bryngelson, B. Talking primates—their symptoms and dis-ease. *J. Lancet.*, 74, 1954, 195-197.

A discussion is presented of the phylogeny of man with emphasis upon the medical recognition of individual differences, especially in the behavior of man. Special references to speech behavior and to parent counseling on the part of the pediatrician are made. (*J.M.P.*)

Cleverdon, D. and Rosenzweig, L. E. A work-play program for the trainable mental deficient. *Amer. J. ment. Def.*, 60, 1955, 56-70.

A learning program for a group of trainable mental retardates is described. Based on the guiding philosophy and principles on which normal children's play activities are structured, the work-play program focuses on the development of social adaptability. There is a general discussion of operational procedures and suggestions are made for the curriculum. Appended to the article are parallel columns detailing the retarded child's learning needs and activity opportunities for satisfying these needs. Among additional items are an equipment list and a suggested daily program. (*B.B.S.*)

Davis, A. and Murray, H. A. Preliminary appraisal of an auditory projective technique for studying personality and cognition. *Amer. J. Orthopsychiat.*, 25, 1955, 543-554.

The authors describe the Azzageddi Test, which is an auditory projective technique consisting of a series of ambiguous or incoherent spoken passages. These passages are constructed by intermingling systematically phrases and statements associated with the following dispositions of personality: optimism, trust, sociocentricity, pessimism, distrust, anxiety, resentment, and egocentricity. The test was administered to twenty male college undergraduates. A preliminary appraisal of the validity of the Azzageddi Test demonstrated that test findings were in agreement with an experienced psychologist's evaluations of the subjects. They also correlated significantly with results of assessments by means of word association and sentence completion tests, and were in keeping with clinical impressions based on intensive investigations of the personalities of the subjects. The authors believe that the results of the preliminary appraisal indicate that the test will be an effective technique for studying personality and cognition and that it possesses potentiality as a diagnostic instrument. The need for further investigation is emphasized.

(*B.S.S.*)

FINNEY, B. C. A scale to measure interpersonal relationships in group psychotherapy. *Group Psychother.*, 7, 1954, 52-66.

This paper describes ' . . . the construction, validation, and use of a scale designed to measure the adequacy of an individual's inter-personal relationships in a group therapy setting.' It contains 88 brief descriptions of behavior scored for the individual by the observer. The text of the scale is reproduced in full. (*J.G.S.*)

FRÖESCHELS, E. Diagnostic puzzles solved by case history. *Speech*, 19, 1955, 21-23.

The relationship between diagnostic procedures and case history is demonstrated by a discussion of a speech case with voice and articulatory deviations. The reasoning behind the ultimate diagnosis is explored.

(*B.B.S.*)

GLOYNE, H. F. Psychosomatic aspects of pain. *Psychoanal. Rev.*, 41, 1954, 135-159.

The author states that the patient unconsciously uses pain as a more primitive means of communication than words or gestures. Pain often represents a physiological conversion, displacement, and repression of sexual and aggressive impulses which are unacceptable to the patient's conscious ego. Pain appears first in the oral stage and its re-appearance later reactivates the threat of loss of object-attachments. Pain often becomes equated with the super-ego. (*J.G.S.*)

GUETZKOW, H. and GYR, J. An analysis of conflict in decision-making groups. *Hum. Relat.*, 7, 1954, 367-382.

This study explores some aspects of the operation of conflict in small, face-to-face, decision-making groups. The analysis is said to be intended to clarify the conditions under which the participants in a conference terminate their deliberations in consensus or disagreement. The results of observations by three investigators suggested that several different kinds of conflict could be observed. Concensus varied depending upon whether 'substantive' or 'affective' conflict was the case; the conditions associated with concensus in each kind of conflict group are outlined. (*J.G.S.*)

LEOPOLD, R. I. Contributing therapies. *Amer. J. occup. Ther.*, 9, 1955, 239-242.

The author discusses problems which can arise in interpersonal relationships when multiple therapists work with a patient. A knowledge and understanding of other therapist's jobs help to create better relationships. A thorough understanding of one's own personality and motivations is necessary to formulate realistic goals for the patient. These goals should not be influenced by the needs of the therapist. Frequent staff conferences are important. Opportunity to discuss freely the problems of each patient is beneficial to the patient and helps to insure better interpersonal relationships among the staff. (*B.S.S.*)

LERNER, R. and MARTIN, M. What happens to the college student with a physical handicap? *Personnel Guid. J.*, 34, 1955, 80-85.

A ten year study of 59 students at Hunter College with major physical handicaps such as orthopedic and neuromuscular disabilities, cardiac conditions, hearing loss, and visual handicaps indicates that the attrition rate of this group is much lower than for entering freshmen. The high school average appears to be the best single measure for prediction of college success though it is not

very reliable. Social work was selected as the vocational goal by the majority of this group. Early and close cooperation between the college guidance service and the state rehabilitation agency plays a major role in the educational and vocational adjustment of these students. (*M.R.*)

LOEFFLER, F. J. AND WEINSTEIN, H. M. The co-therapist method: special problems and advantages. *Group Psychother.*, 6, 1954, 189-192.

The authors conclude that the co-therapist method has advantages which include the presence of a 'less threatening' therapist, better observations of group members and more extensive evaluation, more reassurance, a closely supervised therapy experience, development of self-insight on the part of the therapist, and a resolution of differing points of view. (*J.G.S.*)

MECHAM, M. J., STROMSTA, C. and SODERBERG, G. Effects of Tolserol on the speech errors of mentally defective children. *Amer. J. phys. Med.*, 34, 1955, 535-536.

Twenty-two mentally defective patients at a state school made three recordings repeating a dictated passage containing all the speech sounds, once after no medical treatment, once after receiving two sugar pills three times per day for a week, and once after receiving two tablets of Tolserol (a muscle-relaxing drug which reduces the amount of tonicity in the gross musculature) three times per day for a week. Fourteen judges recorded speech errors heard in phrases selected randomly from each subject. The authors found no significant difference in the number of speech errors of mentally defective patients with increased relaxation resulting from the application of the drug Tolserol. (*F.L.D.*)

PAPANEK, H. Combined group and individual therapy in private practice. *Amer. J. Psychother.*, 8, 1954, 679-686.

The author attempts to give an account of combined treatment and to discuss the empirical basis for its indication. There is also an attempt to evaluate its therapeutic results. Presented as well is a section on some hypothetical generalizations concerning psychodynamics. (*J.G.S.*)

REDL, F. Child study in a new setting. *Children*, 1, 1954, 15-20.

The author discusses efforts being made at the Clinical Center of the National Institutes of Health in understanding the human mind as it is reflected in the emotional disturbance of children. The first studies are attempting the diagnosis and treatment of children with extreme aggressive and destructive tendencies who are difficult to handle in community living. Findings are sought in four areas: (1) working out of their problems by children, (2) the nature of group excitement causing loss of controls, (3) adult response to the behavior of disturbed children, and (4) what children benefit from "treatment homes?" Suggestions are made for research in other areas as well. (*B.B.S.*)

ROSEN, A. C. Change in perceptual threshold as a protective function of the organism. *J. Personality*, 23, 1954, 182-194.

It was hypothesized that the function of perception is to maintain the integrity, tranquility, and equilibrium of the subject. More specifically, it was hypothesized that (1) if the perception is painful and the stimulus is unavoidable, the perception will be interrupted, and (2) if the perception will aid the subject in avoiding a painful stimulus, the ability of the subject to perceive this stimulus will be enhanced and the perception-threshold will be lowered. These hypotheses were tested by use of tachistoscopically controlled stimuli and systematic variation of punishment. The results support the hypotheses and are said to be of value in further research and in clinical settings by aiding in understanding the effect of anxiety-laden material in projective or personality tests. (*J.G.S.*)

SHEEHAN, J. G. FREDERICK, C. J., ROSEVEAR, W. H. and SPIEGELMAN, M. A validity study of the Rorschach prognostic rating scale. *J. proj. Tech.*, 18, 1954, 233-239.

In a validity study of the Rorschach Prognostic Rating Scale, the authors found that prognostic scores discriminated significantly between those adult stutterers in group therapy who showed substantial or great improvement as against those who showed slight or no improvement. The scale similarly discriminated between those who continued in therapy and those who

dropped. The total number of human movement, animal movement, and inanimate movement responses appeared to discriminate equally well between these groups. (*J.G.S.*)

SOCARIDES, C. W. On the usefulness of extremely brief psychoanalytic contacts. *Psychoanal. Rev.*, 41, 1954, 340-346.

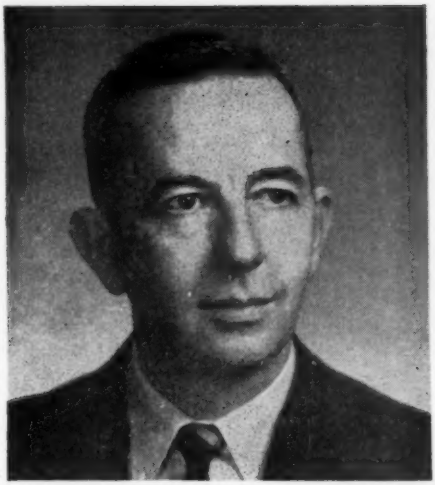
The author states that increasing demands for analytic therapy will necessarily lead psychiatrists away from lengthy procedures and toward briefer analytic therapy. He warns of some of the limitations and dangers of such new techniques. (*J.G.S.*)

WARD, W. The teacher's role in creative dramatics. *Instructor*, 64 (6), 1955, 35, 61, 71.

The author believes that creative drama prepares the child for experience and is an outlet for imagination and emotion. The teacher's relationship with the children is improved by entering into the make-believe. Creative drama is said to offer a means by which the teacher is able to find out about the children. If the teacher realizes how much she can contribute to the development of the child and if she has a feeling for creative drama, she will learn by study and experience how to guide children effectively through this medium. (*B.B.S.*)

WISHNER, J. and SHIPLEY, T. E. JR. Direction of autokinetic movement as a test of the 'Sensory-Tonic-Field.' *J. Personality*, 23, 1954, 99-106.

The purpose of the study was to test the postulate of the sensory-tonic-field theory of perception that motor and sensory components in perception interact. Since it was assumed in this experiment that handedness reflects an asymmetrical distribution of tension favoring the preferred side, left-handers and right-handers were tested with respect to the perceived direction of movement in the autokinetic phenomenon. The results are said to support the hypothesis, but note is made that the preponderance of perceived movement to the left by the left-handers was not up to the expectations. This is explained as being due possibly to a greater degree of heterogeneity as to tensional asymmetry among them. (*J.G.S.*)



JAMES CARRELL

President

The American Speech and Hearing Association

James Carrell is Professor of Speech and Director of the Speech and Hearing Clinic at the University of Washington, a position he has held since 1939. Dr. Carrell is a native of Nebraska and received his baccalaureate degree from Nebraska Wesleyan University in 1927. He subsequently attended Northwestern University, where he was granted an M.A. in Speech in 1929 and a Ph.D. in Psychology in 1936. He has taught basic courses in speech correction and courses in stuttering and organic speech disorders at the Western Washington College of Education, Northwestern University, the University of Oregon and Ohio State University; he has also served as Research Associate at the Mooseheart Laboratory for Child Research. Dr. Carrell is currently a consultant for the Veteran's Administration.

In addition to his pioneer work on the application of cinefluorographic techniques to the study of speech disorders, Professor Carrell has made contributions to the study of articulatory disorders. He is the co-author of a recent book called Hearing Therapy for Children published by Grune and Stratton. Dr. Carrell has published articles in the *Journal of Speech and Hearing Disorders* and in *Speech Monographs*. He is married and is the father of two boys.

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presents THE HONORS OF THE ASSOCIATION

to GRANT FAIRBANKS

In recognition of his many years of distinguished, scholarly editorship of the publications of the ASHA and his leadership and contributions in the area of research; and in sincere appreciation of his service to the Council of the Association in helping to define and to clarify the form and direction of our professional organization and policies; the Honors of the Association are awarded to Dr. Grant Fairbanks.

—The American Speech and Hearing Association, in convention at Los Angeles, California, November 17, 1955

In selecting Grant Fairbanks for this honor, the American Speech and Hearing Association recognizes his outstanding achievement in the experimental study of speech and hearing, his stimulating and profound ability as a teacher, his important contributions in both the theoretical and the practical areas of speech science, and his devoted service to the professional growth of this Association. In his early years as a student at the State University of Iowa, he was strongly influenced by the late Carl E. Seashore, a pioneer in psycho-physical investigation. Professor Fairbanks has greatly enriched and expanded this fine academic heritage.

First published in 1937, Dr. Fairbanks' *Voice and Articulation Drillbook* is widely used wherever instruction and clinical training in the speech skills are to be found. His numerous research contributions show a marked breadth of interest and an outstanding insight into human communication.

Professor Fairbanks, as director of the Speech Research Laboratory at the University of Illinois, is responsible for a program which is highly imaginative and substantial, and which holds a place of primary significance in current research on speech and hearing. Among those who study the science of electrical communication, Professor Fairbanks is best known for his development, in collaboration with W. L. Everitt and R. P. Jaeger, of a practical method for speech time-and-frequency compression and expansion.

The American Speech and Hearing Association holds a special respect and appreciation for Grant Fairbanks because of his unusual achievement as Editor of the *Journal of Speech and Hearing Disorders*. It is particularly appropriate that the Honors of the Association should be awarded to him in the midst of an important and productive career, for many outstanding research contributions may yet be expected from his hand. As evidence of this fact, and as promise of the future, we have the recent excellent report on auditory feedback in the December 1955 issue of the *Journal*. His article on the Theory of the Speech Mechanism as a Servo-System suggests a more philosophical development of fundamental theory which will mark the path for those who follow in experimental research.

Biographical Summary

FAIRBANKS, GRANT, experimental phonetician; b. Austin, Minn., July 26, 1910; m. Helen Cornelius, 1936; ch. Grant Jr., Janet, Lee.

B.A., Univ. Redlands, 1931; M.A., State Univ. Iowa, 1934; Ph.D., State Univ. Iowa, 1936.

Res. Asst.—Assoc. Prof., State Univ. Iowa, 1934-46 (on leave 1943, 1944-46); Assoc. Prof.—Prof., Univ. So. Calif., 1946-48; Prof., Univ. Illinois, since 1948.

NRC, 1943; NDRC research, Psych. Corp., 1943; Captain, AUS, 1944-46; Acoustic Physicist, Chief, Aural Rehab. Sec., Borden Gen. Hosp., 1944-46; Consultant, Army, 1946-52; Consultant, Vet. Admin., 1947-48; Consultant, Control Systems Lab., 1951-54; Prin. Invest., USAF research cont., 1954-56; NRC mem., Comm. on Hearing and Bio-Acoustics, since 1953, Chairman, Working Group, 1954-55.

Member, Amer. Speech and Hearing Assoc. (Fellow, 1941; Vice-Pres., 1947; Councilor, 1948; Editor, 1949-54); Acoustical Soc. Amer. (Fellow, 1941); Amer. Inst. Physics A.A.A.S. (Fellow, 1953); Amer. Psych. Assoc.; Diplomate, Clinical Psychology, A.B.E.P.P., 1948; Speech Assoc. Amer.; A.A.U.P.; Sigma Xi.

Author, research reports and articles; *Voice and Articulation Drillbook*, 1937, 1938, 1939, 1940; *Examination and Diagnosis of Voice and Articulation Disorders*, 1941; *Practical Voice Practice*, 1944; Editor, *Journal of Speech and Hearing Disorders*, 1949-54.

News And Announcements

A Placement Registry Service is maintained in the office of the Secretary-Treasurer of the American Speech and Hearing Association for all members seeking employment or change of employment. Two lists are prepared bi-monthly: one, of members seeking employment, which is sent to potential employers, and one, of employers who are registered with the Placement Service, which is sent to listed members. A large list of job opportunities is on file and is available to members of the association only. Members who are seeking employment or persons and agencies who desire to secure the services of members are urged to register with the Placement Registry Service. There are no charges for the Placement Service.

Dr. Harlan Bloomer, immediate past president of the American Speech and Hearing Association, was invited by President Eisenhower to take part in the White House Conference on Education in Washington, D. C., November 28-December 1. Participants in the White House Conference discussed six subjects which have been studied previously in most of the 4,000 community and 53 state and territorial conferences on education during 1955. The topics were: (1) What should our schools accomplish? (2) In what ways can we organize our school systems more efficiently and economically? (3) What are our school building needs? (4) How can we get enough good teachers—and keep them? (5) How can we finance our schools—build and operate them? (6) How can we obtain a continuing public interest in education?

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C. E. Renfrew, Chief Speech Therapist of the United Oxford Hospitals, England, reports that Speech Therapy has developed as a single unified profession in Great Britain over the last 50 years. The organizing and controlling professional body is the College of Speech Therapists. The College has functions with regard to the syllabus of training, qualifying examinations, and negotiations on salaries and conditions of work. There are over 800 members. Hospital authorities employ about one third of the profession, and school authorities most of the remainder. All speech therapy is free under the National Health Service so very little private practice is carried on.

News and Announcements is edited by Mary W. Huber, Los Angeles State College, assisted by the following committee: Sue Earnest, San Diego State College; Lester L. Hale, University of Florida; Henry Moser, Ohio State University; Severina Nelson, University of Illinois; Max Nelson, Michigan State College, and Earl Schubert, State University of Iowa.

According to K. M. Jagger of the Oxford Infirmary, England, the passing of a new Health Act in Great Britain in 1948 has resulted in the deaf and hard of hearing receiving more attention at a national and local level than ever before. All over England diagnostic clinics have been set up and hearing aid distribution centers opened. An advisory council for the welfare of handicapped persons has been set up; as a result many local authorities have taken action and drawn up schemes for the social well being of the deaf and hard of hearing. More interest has been shown in the early diagnosis of deafness. Pre-school clinics have been started in some places and there is now a residential center for mothers and babies in London.

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Twelve post-doctoral fellowships, valued at $5,000 each, will be awarded at the University of Illinois during the next five years to holders of the Ph.D. in education, psychology, or sociology who can qualify for special training in education of exceptional children. A grant of $75,000 for the support of these fellowships has been made by the Ford Foundation. The programs they will pursue will be directed toward developing highly trained personnel for teaching and administrative positions in education of mentally handicapped, crippled, deaf, or gifted children. First of these grants has been made to Leonard S. Blackman who holds the Ph.D. from Illinois in Child Development. Professor Samuel A. Kirk, director of the University's Institute for Research on Exceptional Children, will supervise the post-doctoral studies, which will include seminars, teaching, and participating in research projects of the Institute.

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1868. According to the Library of Congress, the *Annals* is probably the oldest educational journal in the United States, and is the oldest publication in the world on the education of the deaf. For over a century the *Annals* has been publishing educational information concerning the deaf for teachers, executives, and parents of deaf children. The editorial office of the *Annals* is located at Gallaudet College in Washington, D. C. Gallaudet College has added twenty-four new staff members for its ninety-second academic year. Among the list of newcomers is Carl E. Rankin, formerly superintendent of the North Carolina School for the Deaf. Dr. Rankin succeeds Dr. James I. Lore, who has left to join the Speech and Hearing Clinic of Walter Reed Hospital, Forest Glen, Maryland.

The Los Angeles State College Department of Special Education and the Division of Language Arts, which includes Speech and Speech Correction, has moved to a special building which has been constructed to house the clinical services on the the College's new site. These will include speech and hearing therapy, remedial reading, psychological testing, and parental counseling.

The Crippled Children's Society of Los Angeles County has opened a branch center to serve San Fernando Valley. Rancho Del Valle consists of three buildings on seven acres of ground and is the rehabilitation and recreation center for crippled children and adults of the San Fernando Valley. Included in the center are a heated swimming and wading pool, a specially insulated speech therapy room, a converted barn for recreation, and a specially designed playground.

The Community Speech and Hearing Center at Enid, Oklahoma began operation early in September 1955. The Center was made possible by funds donated by citizens of Northwest Oklahoma during a Telethon held in Enid under the auspices of United Cerebral Palsy, Inc. Dr. Thayne A. Hedges is Director of the new Center and Mrs. David Tull and Mrs. Robert Pettys have joined the staff as speech and hearing therapists.

The University of Michigan Speech Clinic has expanded its out-patient services through the division of Speech Correction Services under the auspices of the Dean of the Medical School and the Department of Otolaryngology. Quarters assigned to the staff of the Speech Clinic are located in the new Out-Patient Clinic of the University Hospital in the Pediatrics area. This division provides diagnostic and consultational services to the medical clinics of the hospital. Residential quarters have been provided in connection with the Speech Clinic Dysphasia Division through the cooperation of the University Service Enterprises. Therapy is provided five days a week in an intensive, full-day program for 20 patients per semester.

As a result of a grant by the Federal Department of Health, Education, and Welfare the clinical program at Central Michigan College has been enlarged. Dr. Keith Maxwell is the audiologist on this rehabilitation program and Marvin Chernoff is speech pathologist.

The forty-six schools of Arlington County in Virginia have a new Supervisor of Speech Education. Dr. Jean C. Ervin, former member of the Speech Faculties of the University of Missouri, University of Hawaii, and University of Connecticut, is to head the staff of twenty-five teachers of speech in its elementary and secondary schools. Dr. Ervin replaces Mrs. Zelda Kosh who was Arlington's first Supervisor of Speech Education.

A gift of $10,000 from Delta Zeta, national women's social sorority has been presented to Gallaudet College. The money will be used to furnish the main reading room of the new Edward Miner Gallaudet Memorial Library. Delta Zeta has adopted Gallaudet College as a national philanthropic project. Mrs. Sylvia E. Rulff has been chosen as the first recipient of Delta Zeta Sorority's National Audiology and Allied Fields Scholarship of $500. Miss Rulff is a student of Indiana University majoring in speech correction and hearing therapy.

A state professional organization to be known as the New Jersey Speech and Hearing Association was formed at a recent meeting at the St. Barnabas Hospital Cleft Palate Center in Newark.

For the past six years a research project concerned with breathing problems in cer-

ebral palsied children has been carried on at the Orthopaedic Hospital in Los Angeles. Partially supported by the United Cerebral Palsy Association, this work has been undertaken in an effort to study those breathing irregularities which particularly affect speech. Mrs. Mary Ann Petersen, Speech Therapist at the Hospital, is assisting with the research. Both she and Dr. Harrington are active in the summer speech workshops which are annually sponsored by the Hospital. These workshops, presented for special education teachers as well as for qualified speech, physical, and occupational therapists, demonstrate specific speech procedures as developed and used at the Orthopaedic Hospital. The 1956 Workshops will be offered between July 9th and 20th. Information can be obtained by writing Dr. Robert Harrington, Speech Pathologist, Orthopaedic Hospital, 2400 Flower Street, Los Angeles 7, California.

Ears of 60 vertebrate and invertebrate animals will be studied as part of a new research project at Wayne University College of Medicine. The study, directed by Dr. Heinrich G. Kobrak, professor of otolaryngological research, is expected to increase understanding of the human ear and its diseases. The study will inquire into the hearing ability of various animals and pertinent construction differences in animals' ears. Of special interest will be tests made on animals which developed from water living, such as the whale and water fowl, adapted themselves to land living, and then returned to the water. Beltone Institute for Hearing Research is financing the project.

A nine weeks course in Speech Correction is being offered currently under the title 'University TV' on KFMB, Channel 8 in San Diego, California. Participants are students and children from the Speech Clinic at San Diego State College. Writer, director, and moderator of the series is Dr. Sue Earnest, Professor of Speech Correction at the College. Areas covered by lecture and demonstration are: Speech Development, Delayed Speech, Creative Speech, (verse choir and interpretation), Articulatory Problems, Stuttering, Hearing Impairments, Cerebral Palsy, Cleft Palate, and Foreign Accent. The text used is *Speech and Hearing Hurdles* by John Irwin and John Duffy. Townspeople may earn one unit of credit by taking a final examination.

In the December 1955 section of News and Announcements it was incorrectly stated that Charles M. Lightfoot had been appointed Director of the Cleft Palate Training Program and Center, University of Illinois College of Medicine. Dr. Lightfoot is now Associate Professor of Otolaryngology in the University of Illinois College of Medicine and Director of the Speech and Hearing Center of the Illinois Eye and Ear Infirmary in Chicago.

The second Postgraduate Course in Esophageal Speech and Organic Voice Problems will be offered from June 18 to June 30, 1956 in Miami, Florida. The class for the two week course (50 hours) is limited to thirty and is under the direction of Nathaniel M. Levin, M.D., F.A.C.S. and staff. Persons with an M.A., M.S., Ph.D., or M.D. degree are eligible; there are limited openings for those with B.S. or B.A. degrees who are speech majors. Traineeships (tuition and traveling expenses) valued at $250 each are available from the Office of Vocational Rehabilitation, Department of Health, Education and Welfare, Washington, D. C. to qualified individuals on application. Apply to: Nathaniel M. Levin, M.D., 1431 North Bayshore Drive, Miami, Florida.

Meetings Announced

American Speech and Hearing Association, Chicago, November 19-21, 1956.

International Council for Exceptional Children, April 10-14, 1956, The Nicollet Hotel, Minneapolis.

Sixth International Congress of Otolaryngology, May 5-10, 1957, Washington, D. C.

Special Education Conference, University of Missouri, Columbia, Missouri. Memorial Student Union, June 21-22, 1956. Sponsored jointly by the College of Education and the Adult Education and Extension Service of the University.

Seventh National Science Fair, Municipal Auditorium, Oklahoma City, May 10-12, 1956.

Alexander Graham Bell Association, June 18-22, 1956, Los Angeles. Sponsored by the John Tracy Clinic and the Mary E. Bennett School for the Deaf in Los Angeles.

Central States Speech Association, Hotel Sherman, Chicago, April 6-7, 1956.

Southern Speech Association, Forrest Hotel, Hattiesburg, Miss., April 2-7, 1956.

Speech Association of the Eastern States, Hotel Statler, New York, April 12-14, 1956.

Speech Association of America, Conrad Hilton Hotel, Chicago, December 27-29, 1956.

The American Association for Cleft Palate Rehabilitation will meet at the Muehlebach Hotel in Kansas City, Missouri, May 3-5, 1956. Arthur F. Lindquist, D.D.S., Associate Professor of Prosthetics and Chairman on Cleft Palate Rehabilitation will conduct a post graduate course for Cleft Palate Rehabilitation during the four days preceding the meeting. April 29-May 2, 1956. Although this course is primarily designed for dentists, speech people are welcome to attend the lectures and watch the clinical and laboratory work. For further information write to Joseph F. Jacobs, Director, Postgraduate Division, University of Kansas City School of Dentistry, Tenth Street and Troost Avenue, Kansas City 6, Missouri.

New Materials

Aphasia Rehabilitation, written by Mrs. Martha L. Taylor and Dr. Morton Morlsa, is designed to instruct the untrained person in methods of speech therapy with aphasics. Photographs and cards make up the teaching material. It sells for $3 and can be secured from the Institute for Physical Medicine and Rehabilitation, 400 East 34th Street, New York 16, New York.

The Longerich Aphasia Therapy Sets, a box of small picture flash cards with line drawings in black on yellow background with punch-out attachments of the printed word, are available at $1.50 per box. Order from, Mary C. Longerich, Ph.D., 2007 Wilshire Boulevard, Los Angeles 57, California.

Four basic guides to methods of community care for handicapped children will be issued by the American Public Health Association. These basic reference manuals represent six years of work by over 200 leading specialists in the medical, rehabilitation, and public health fields, working in collaboration with a special sub-committee of the Committee on Child Health of the American Public Health Association. The basic guide, *Services for Handicapped Children,* deals with problems common to various handicapping conditions. It outlines principles and practices to make the most of existing facilities, or to aid in establishing services where these are poorly organized or lacking altogether. Three other guides show how these general principles and practices can be used in planning services for children with such special problems as *Cerebral Palsy, Cleft Lip and Cleft Palate, and Dento-Facial Handicaps.* The publications were made possible by grants from the Association for the Aid of Crippled Children and the New York Fund for Children and a grant from the Ittleson Family Foundation. They are priced at $1.50 each, or at a special price of $5.10 for the set of four. Orders should be addressed to: Committee on Child Health, American Public Health Association, 1790 Broadway, New York, 19, N.Y.

Improve Your Speech is a set of three pocket guides to Speech Practice. Pocket Guide 1 contains a complete analysis of the procedure of the oral examination for teaching or supervisory licenses. Pocket Guide 2 contains carefully graded practice material for correcting a lisp. Pocket Guide 3 contains carefully graded practice material for correcting common errors in the production of consonants. The guides are $1.00 each, and may be ordered by mail from Dorothy Mulgrave, 250 Fourth Avenue, New York 3, N. Y.

A directory of facilities for speech and hearing therapy in New York City, New Jersey, and the metropolitan New York area prepared by Maryann Peins and Mary Pettas may be ordered from the Welfare and Health Council of New York City, 44 East 23rd Street, New York, New York, for fifty cents.

Your Child's Speech—Normal or Defective? a handbook for parents, by Robert

F. Hejna, Speech and Hearing Clinic, University of Wisconsin, contains information about first words, early sentence usage and construction, the use and mis-use of sounds, early non-fluency, or 'stuttering'—and what to do about it, and where to go for help and home management of the pre-school speech defective child. The 46 page handbook may be obtained for 75 cents per copy from Speech Materials, College Typing Company, 527 State Street, Madison 3, Wisconsin.

A new picture *Developmental Articulation Test* prepared by Robert F. Hejna consists of a series of 27 color-picture cards designed to test the full range of consonant sounds in each of the three positions. The pictures have been carefully selected on the basis of interest value and familiarity to children. The sounds have been arranged according to their normal order of development, from easiest to most difficult. The developmental scale accompanying the pictures shows the age by which the child should be using particular sounds. The cost of the test, including 25 scoring blanks, is $1.25. Address College Typing Company, 527 State Street, Madison 3, Wisconsin.

See-Quees are puzzle boards of colorful squares arranged in sequential order and designed for speech motivation, reading readiness, story telling, and problem solving. For a Catalog of Materials, write The Judy Company, 310 N. 2nd Street, Minneapolis, Minn.

The *Bulletin on Current Literature*, published since 1940 by the Library of the National Society for Crippled Children and Adults, has changed its title to *Rehabilitation Literature*, beginning with the January 1956 issue. The new name will identify better the subject coverage of the monthly bibliographic bulletin, which will continue to index and abstract not only medical and therapy literature but also the current periodical articles, pamphlets, and books in the other professional areas of special education. The bulletin is published monthly and its subscription rate is one dollar a year.

The regular issue of the *American Annals of the Deaf* for September, 1955, contains a list of 150 Doctors' dissertations and 960 Masters' theses on the education of the deaf from 1898 to 1955. The theses are indexed by authors, subject matter, states, colleges, and universities. The price for this special number is $2.00. Orders should be sent to the Editor, *American Annals of the Deaf*, Gallaudet College, Washington 2, D. C.

The Language Master is an audio-visual learning and teaching device. It reproduces the human voice from record members which are coated, printed cards containing words and sentences recorded on a magnetic sound strip. This means that words, phrases, or-sentences can be selected from a file, heard in any chosen sequence, and repeated as often as desired. The accompanying printed material can be studied visually as the sound is heard. With the use of the headphones the patient can practice by himself. Five series of cards will be available with the instrument for use in speech courses in schools and colleges and in speech correction clinics and remedial centers. The series include: Vocabulary Builder Series, Word Learning Picture Series, Language Stimulation Series, English Development Series and Sounds of English Series. Dr. Paul Moore, Director of the Voice Research Laboratory in the Northwestern University Medical School, has been active in the editorial planning and preparation of *The Language Master* since its inception. *The Language Master* is manufactured by El-Lamac, Inc., of Chicago, Illinois, and is distributed by McGraw-Hill Book Company, 330 West 42nd Street, New York 36, New York.

The Chapter Supply Company, Danville, Illinois, sells a binder for a year's issue of the *Journal of Speech and Hearing Disorders*. It is made with black leatherette over heavy binder-board fitted with strong 3-ring metals. The covers are gold-stamped on the back-bone with the name of the *Journal*. The cost is $1.50 each. They may be ordered from Chapter Supply Company, Fairchild at Robinson, Danville, Illinois.

Thursday's Children, a film evaluated and recommended for college classes in Teacher Education and Special Education, is a winner of the Academy Award 'Oscar' as the best documentary short subject of 1954. The children of this film are deaf and the story tells of their rehabilitation through the skill of their teachers. It is a British Information Services film in black and white,

22 minutes, rental $2.50, sale $75.00. Address: 30 Rockefeller Plaza, New York 20, New York.

Tachistoscopic Techniques with the Cerebral Palsied is a film intended to provide opportunity to observe handicapped pupils in an un-rehearsed and natural classroom situation, being taught reading readiness, spelling, penmanship, vocabulary, and reading improvement by tachistoscopic techniques. It was produced by Gaspar Cisneros Barnette of Occidental College, Los Angeles, and is distributed through Learning Through Seeing Films, 10304 Oro Vista Avenue, Sunland, California. Ten minutes, black and white, 16mm, sound, $40.00.

Graduate Assistantships, Fellowships and Scholarships

Assistantships. University of Michigan Speech and Hearing Clinic. Stipends range from $1200 per academic year at the Master's candidate level to $1620 at the Doctoral degree level. Prorated stipends are also available for the summer sessions.

Assistantships. Boston University Speech and Hearing Center. Assistants participate in both diagnosis and therapy. Speech therapy and audiology. Remission of $600 tuition for full-time graduate study. Address Wilbert L. Pronovost, Director Speech and Hearing Center, Boston University, Boston, Massachusetts.

Training Fellowships. Vanderbilt University School of Medicine. Starting September. Programs leading to the Master of Science degree in speech correction, audiology, or teaching of hearing impaired children. Fellowships pay tuition and monthly stipend of $100.00-$130.00 for twelve months. Address Forrest Hull, The Bill Wilkerson Hearing and Speech Center, 2109 Garland Avenue, Nashville, Tennessee.

REPORT OF THE CONVENTION
American Speech and Hearing Association
LOS ANGELES, CALIFORNIA, NOVEMBER 15-19, 1955

The 481-page stenographic report and the copies of reports submitted by officers and committee chairmen constitute the minutes of the 1955 Convention. These are on file in the office of the Secretary-Treasurer. The following abstract of proceedings includes all matters of business introduced by motions during the Council and Business Meetings.

Council Meetings

November 15, 1955, 1:45 p.m.

The following officers and members of the Council were present: President Harlan Bloomer, presiding; Stanley Ainsworth, Ollie Backus, James A. Carrell, James F. Curtis, Leo G. Doerfler, Lester Hale, John Irwin, George A. Kopp, Jack Matthews, Gordon E. Peterson, Margaret Hall Powers, and Charlotte G. Wells.

President Bloomer called the meeting to order, and presented the agenda with the hope that every item on it could be considered during the next day and a half.

Minutes of the 1954 Convention. President Bloomer stated that the Council had an opportunity to review the minutes of the 1954 Convention as presented in the March, 1955 issue of the *Journal of Speech and Hearing Disorders* and asked if there were any additions, corrections, or comments.

Moved by Curtis and seconded by Matthews that the 1954 minutes be approved. Passed.

Report of the President. President Bloomer enumerated in his report the following items of business which had been transacted in his office since January 1, 1955:

Notices of appointments of standing committees were sent immediately upon taking office. Early acceptances were received from nearly all appointees. The following committee replacement appointments were made by the President following approval of the Council:

Lester Hale, as Councilor-at-Large, to fill the unexpired term of Stanley Ainsworth, March 26, 1955.

John Irwin, as Chairman of the Committee on Organizational Structure of ASHA, replacing Leo Doerfler who resigned, July 1, 1955.

The following special committee appointments were made:

Committee on Group Insurance. Membership included George A. Kopp, Freeman McConnell, James Mullendore, Mack Steer, and Delyte Morris, Chairman.

Sub-Committee of the Committee on Clinical Standards in Speech, to study problems of public school speech correction. Membership included Agnes Frye, Geraldine Garrison, Sybil Gholson, Dorothy Kester, and Ruth Beckey Irwin, Chairman.

Committee to Study the Problem of Insignia for Speech Therapists. Membership included Harold Edmondson, Bruce Graham, and John Montgomery, Chairman.

Sub-Committee on Liaison to Review Civil Service Qualifications in Speech Pathology and Audiology. Membership included Stanley Ainsworth, ex-officio, Kenneth Johnson, Darrel Mase, and Wendell Johnson, Chairman.

Ad-Hoc Committee to Study Problems of Certification at Training Centers. Membership included Jack Matthews, Charlotte Wells, and John Gaeth, Chairman.

The following special appointments to represent ASHA were made by the President:

Dean E. Williams as liaison representative to the Central States Speech Association Convention in Chicago, 1956.

Leon Lassers as representative to the 38th Annual Institute for the American Occupational Therapy Association Meeting in San Francisco, October 25-28.

Calvin Pettit as representative to the President's Committee on Employment of the Physically Handicapped meeting.

Clara K. Mawhinney as representative to attend the inauguration of Dr. Rodes as

President of Bradley University, Peoria, Illinois.

Jane Dorsey Zimmerman as representative to the inauguration of Dr. Hollis Leland Caswell as President of Columbia Teachers College.

Eugene McDonald as representative to attend the meeting of the National University Extension Association at State College, Pennsylvania.

The President represented the Association at the Centennial Celebration of Michigan State University at East Lansing, Michigan. He spoke by invitation of the Southern Speech Association at the Silver Anniversary of the Southern Association at its Convention in April, 1955, at Memphis, Tennessee. He attended two meetings of the Planning Committee scheduled for the year 1955, and met with the Committee appointed to Study Establishment of a National Office.

The Sub-Committee on Liaison in Audiology under Chairmanship of Raymond Carhart requested permission to prepare an exhibit on the work of the American Speech and Hearing Association for display at the meetings of the American Academy of Ophthalmology and Otolaryngology in Chicago, October 9-14. Expenditure of $300 for preparation of this exhibit was authorized by the Budget Committee.

A proposal for amendment to the By-Laws submitted by Duane Spriestersbach was received and circulated to the Council. (Council action taken by mail was reconsidered as reported in another section of these minutes.)

Moved by Backus and seconded by Carrell that the report of the President be received. Passed.

Two recommendations in the President's report, one insuring that the offices of President-Elect and Vice-President shall not be held concurrently by one person, and another that the Association adopt a procedure of adding Vice-Chairmen in the committee structure, were deferred for consideration under New Business.

Report of the Vice-President. Carrell presented an analysis of the 1955 Convention program which included 56 sectional meetings and two Film Theater exhibitions. Of the section meetings, 29 were devoted to speech disorders, 16 to various aspects of hearing disorders, four to experimental phonetics, and seven to professional problems. In addition to 56 section chairmen, a total of 254 persons (allowance not made for those appearing on more than one program) presented papers or participated in the professional programs. The following notations were made for consideration by the 1956 Program Committee: possibility of repeating a program questionnaire to members attending the convention; advisability of encouraging members to submit papers for consideration for a place on the program; desirability of establishing a definite policy in respect to a member participating in more than one section of the program; increasing cost of audio-visual aids; and the recurring question concerning an Association luncheon, dinner, or other quasi-social event.

Suggestions were made during discussion of the possibility of designating standard audio-visual equipment available for the program and for a procedure that would permit the Program Chairman to obtain from persons placed on the program the kind of audio-visual equipment needed.

Moved by Peterson and seconded by Kopp that the report of the Vice-President be accepted with commendation. Passed.

Report of the Executive Vice-President. Ainsworth reported that the major functions of his office were relegated to several sub-committees. As chairman of the sub-committee on Relations with the American Psychological Association, he stated that a positive and constructive approach to establishing and working out relationships had been under discussion by this committee. Carhart's report as Chairman of the sub-committee on Liaison with American Academy of Ophthalmology and Otolaryngology, and the report of Morris, as chairman of the sub-committee on Group Insurance, are to be presented as separate reports. Because of the date of appointment, no report was expected from Johnson, chairman of the sub-committee on Liaison with Federal Agencies.

Other activities of the Liaison Committee, acting through its Chairman, were as follows: appointment of Wilbert Pronovost to represent the ASHA at the Convention of the National Society for Crippled Children and Adults, Inc., in Boston, November 2-6, 1954; appointment of Margaret Hall Powers to represent the ASHA at the Executive Council meeting of the Speech Association of America on December 27, 1954; response to six inquiries regarding sources of clinical service; and consideration of suggestions for additional sub-committees.

Recommendations in the report included the preparation of a clear statement of the nature and implications of speech correction and audiology and relationships with other professions. This was interpreted to be important and a responsibility of the Committee on Liaison. The recommendations to exchange copies of convention programs with officers of other professional organizations and to include on the ASHA convention program a joint meeting with representatives from other organizations for the purpose of discussing interorganizational relationships, received general approval.

Moved by Carrell and seconded by Powers that the report be accepted. Passed.

Report of the Secretary. Kopp presented the Secretary's report consisting of explanations of how the Council's instructions had been carried out in respect to: (1) lettering, signing, and mailing Fellowship Certificates; (2) recording Minutes of Association meetings; (3) keeping the Archives of the *Journal of Speech and Hearing Disorders;* (4) maintaining insurance of inventories at Interstate Printers and Publishers and in Detroit; (5) continuing bonds for the Secretary-Treasurer and his Administrative Assistant; (6) providing contingency and petty cash funds for officers and specified committees; (7) notifying Associates of increase of dues beginning with the sixth year of their Associateship; and (8) preparing the copy for the Pre-Convention Flier, the Convention Program, and the Annual Membership Directory. In addition, the report included: an analysis of the placement registry service; a statement of the securing of a first class mailing permit from the Post Office; a detailed explanation of the conversion of all member and subscriber records to IBM cards; a review of the procedure for handling hundreds of requests for recommendation of clinics and clinicians; an enumeration of the convention details handled in the central office; the action taken with respect to the request of Interstate Printers and Publishers for a review of the contract with the ASHA that had not been changed since 1948; a notation of the request of the Editor of the *Journal* for an additional $2,000 for the salary of the Assistant to the Editor, submitted to the Secretary as Chairman of the Budget Committee and approved by the Budget Committee; a copy of the Interstate proposal for printing 1956 *Journals* with a recommendation that it be approved; and a detailed listing of the *Journal of Speech and Hearing Disorders* Inventory including a cost and sale price analysis of all the publications.

Moved by Backus and seconded by Powers that Interstate's proposal dated October 20, 1955, for the printing, binding, and mailing of the *Journal of Speech and Hearing Disorders* for the year 1956 be approved. Passed.

Moved by Peterson and seconded by Powers that the report of the Secretary be accepted. Passed.

Report of the Treasurer. Kopp's report as Treasurer included: the Auditor's (Peat, Marwick, Mitchell & Co., Detroit) report showing a total asset figure of $32,333.61 as of December 31, 1954; a statement of income for the year ending December 31, 1954, and a statement of accumulated earnings; the Treasurer's statement of Income and Expense for the period January 1, 1955, to October 31, 1955, showing income posted to Publications as $8,602.87 greater than expenses, and income posted to the General Fund as $7,276.61 greater than expenses; a Balance Sheet as of October 31, 1955, showing a total Liabilities and Net Worth, $40,711.64; an itemized statement of estimates of donations to the Association by various colleges and state universities totaling $15,398.40; a Breakdown of Printing Costs for the period January 1, 1954, to January 1, 1955; and a Table of Comparison of Increase in Membership with Increase of Costs of Running the ASHA for the period 1951 through 1954. (Extracts from this report are printed following these minutes.)

Moved by Powers and seconded by Ainsworth that the report be accepted with commendation. Passed.

Moved by Powers and seconded by Ainsworth that the Directory be charged to the General Fund at the Treasurer's discretion.

Moved by Irwin and seconded by Ainsworth to amend the motion by striking out the words, 'at the discretion of the Treasurer.' Lost.

Moved by Peterson and seconded by Irwin to amend the motion by adding the phrase 'for the years 1955 and 1956.' Passed.

The main motion as amended, that the Directory be charged to the General Fund at the Treasurer's discretion for the years 1955 and 1956, was passed.

Report of the Sub-Committee on Liaison with the American Academy of Ophthalmology and Otolaryngology. Carhart re-

viewed the background that led to the appointment of his committee. A special committee on Liaison between Otology and Audiology was appointed by the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology. The special committee was authorized to invite the American Speech and Hearing Association to establish a companion committee. This invitation was accepted. The ASHA sub-committee on Liaison met with the committee of Otologists and out of that meeting developed two things. First, it was recommended in the discussions that the ASHA should have an exhibit at the 1955 meeting of the Academy in Chicago for the purpose of disseminating information concerning the ASHA. The exhibit emanated from Carhart's office and it consisted of several panels showing the purpose, chronology, membership requirements, standards of clinical competence, types of certificate, Code of Ethics, and publications of the Association. Copies of publications of the Association, including the *Journal*, *Monographs*, *Directory*, reprints of Minimum Requirements for Certification, Code of Ethics, and By-Laws were displayed on a table in front of the panel exhibit. (Pictures of the exhibit have been received for inclusion in these minutes but it is believed that much of the excellent detail would be lost in printing. The exhibit will be available upon request to the office of the Secretary-Treasurer.)

Secondly, the Committees on Liaison between Otology and Audiology prepared a report to clarify the relationship between the practicing otolaryngologist and the lay specialist in hearing problems (often called a 'clinical audiologist'). The report as presented to the Council consisted of three parts: (1) a statement of a mutually acceptable orientation to the problems under consideration; (2) specific recommendation for encouraging inter-professional cooperation; and (3) a review of topics warranting further attention.

Carhart stated that the report was presented to the Committee on the Conservation of Hearing November 13, 1955. The Committee on Conservation of Hearing did three things. First, it passed a resolution, thanking the ASHA for appointing the Committee on Liaison with the Academy and expressed pleasure at what had been accomplished. Secondly, the report was accepted. Thirdly, the report was turned back to its own committee with the request that certain revisions be made.

Discussion was focused on the implications of the report, its phraseology, the standards for audiometric technicians, and the possible legal aspects involved.

Moved by Wells and seconded by Doerfler that the Council, on behalf of the ASHA, accept the report of the Committees on Liaison between Otology and Audiology and accept the report of the joint committee. Passed.

Moved by Ainsworth and seconded by Wells that the Committee be instructed to continue revision of the report, to assist in setting up standards for audiometric technicians, and to secure legal advice regarding the wording of the report. Passed.

Adjourned at 5:30 p.m.

November 15, 1955, 7:20 p.m.

The same officers and members of the Council were present as listed for the afternoon meeting.

President Bloomer called the meeting to order and asked for the report of the Committee on Publications.

Report of the Committee on Publications. Because of the absence of the Chairman of the Committee, Robert West, the written report was considered without the benefit of the interpretation of the person who prepared it.

Moved by Kopp and seconded by Peterson that the report be accepted. Passed.

During the discussion that followed, this report was referred back to the Committee on Publications for review and recommendations. After two meetings of the committee, Kopp, acting as Chairman at the written request of West, reported to the Council that it was the unanimous opinion and recommendation of the Publications Committee that the report of the Chairman of the Committee on publications should be received and referred back to the Committee for further study of the relative merits of the projects presented in the report. (Extracts from West's report are printed following these minutes.)

Moved by Hale and seconded by Matthews that the recommendation of the committee be approved. Passed.

Report of the Editor of the Association. Moved by Kopp and seconded by Backus that the report be received. Passed.

The major portion of the report was concerned with editorial policies, and with the administrative relationship between the offices of the Editor of the Association and the Editor of the *Journal*. After thorough consideration and discussion, the Council formulated a joint statement regarding the report. The By-Laws were interpreted by the Council to mean that the Editor of the Association does not have a direct editorial responsibility for the individual publications of the Association. The essential responsibilities of the Editor of the *Journal* are defined in Article XII, sections 1 and 2, of the By-Laws of the Association.

Report of the Editor of the Journal. Peterson presented the report and answered numerous questions pertaining to the administration of his office, duties of the Editorial Staff and the procedures used in processing manuscripts received for publication. (An extract of the report of the Editor of the *Journal* is printed following these minutes.)

Moved by Kopp and seconded by Irwin that the report of the Editor of the *Journal* be accepted with commendation. Passed.

Proposed Amendments to By-Laws. President Bloomer requested clarification of procedure in handling proposed amendments to the By-Laws that had been approved by the Council by mail ballot during the summer. It was the general opinion of the Council that these changes in the By-Laws should be presented to the membership at the forthcoming Business Meeting.

Report of the Budget Committee. Kopp presented an estimated budget for the fiscal year January 1, 1956 to December 31, 1956, showing cash receipts of $43,724.00 and cash disbursements of $35,137.50.

Moved by Carrell and seconded by Curtis that the submitted budget be approved. Passed.

Report of the Membership Committee. Kopp reported that the Membership Committee processed and approved for Membership 779 persons during the period October 1, 1954 to October 30, 1955. Of these, 688 were new applicants and 91 were applicants who held Associateship prior to January, 1951. Two hundred and forty-six Associates were processed during the period October 1, 1954 to October 30, 1955. One hundred and seventy-nine Members and 153 Associates were dropped from the membership rolls in 1955 for non-payment of dues.

The report included an analysis of the ASHA Members showing classification, certification, education, and employment of members as of July 15, 1955, and a recommendation that dues for Associates be increased to $5.50 per year. This recommendation was made because (1) Associate dues have always been the same as the foreign subscription rate to the *Journal*, (2) the cost of printing the *Journal* was increased this year, (3) the present $4.00 Associate dues is less than the domestic subscription rate for the *Journal*, and (4) the present dues of Associates hardly pay for the publications received by them. (Extracts from this report are printed following these minutes.)

Moved by Hale and seconded by Powers that the recommendation to elevate the Associate dues to a sum equivalent with foreign subscription costs be approved. Passed.

Moved by Powers and seconded by Wells that the report be received. Passed.

Unfavorable consideration was given by the Council to an application for membership submitted by a person who does not hold the approved qualifications.

Report of the Committee on Time and Place. Ainsworth recommended that the 1957 Convention be held in the Netherlands Plaza Hotel, Cincinnati, Ohio.

Moved by Kopp and seconded by Ainsworth that the recommendation be approved. Passed.

Ainsworth presented a series of suggested patterns for the ASHA Conventions for the period 1958 to 1961.

Adjourned at 10:30 p.m.

November 16, 1955, 9:15 a.m.

The same officers and members of the Council were present as listed for the first meeting.

President Bloomer called the meeting to order and requested Ainsworth to continue with his report.

Report of the Committee on Time and Place (continued). Ainsworth completed his explanation of the suggested patterns for convention sites and expressed a preference for the East, Midwest, West and Midwest sequence beginning in 1958.

Moved by Backus and seconded by Mathews that the recommended pattern be adopted. Passed.

Moved by Powers and seconded by Backus

that the Committee on Time and Place recommend to the Council the convention city taking into consideration the public relations aspect of the location. Passed.

Moved by Hale and seconded by Matthews that the report of the Committee on Time and Place be accepted. Passed.

Report of the Committee on Clinical Standards in Speech. Matthews presented the following report:

The Committee has no recommendations to propose for Council action. The following items are set forth to provide the Council with a better understanding of the activities of the Committee during the past year.

1. The work of the Committee was carried out by correspondence and was supplemented by a few meetings of the Chairman with several Committee members.

2. The majority of the Committee work was concerned with giving opinions on 'atypical' cases referred by the Committee on Clinical Certification. The criteria worked out by the Standards Committee several years ago have guided the present Committee's actions. Because the Committee received no requests from the Committee on Clinical Certification concerning interpretation of acceptability of course offerings in various training centers, the Committee has done no further work with the descriptions of courses submitted several years ago by training centers. A spot check of the materials submitted by various training centers reveals that considerable change has taken place in the curricular structure during the past few years. It is the feeling of the Committee chairman that the materials gathered several years ago are of very limited value at the present time.

3. The Committee sees no reason for taking special action in regard to the administration of the grandfather provision. It is the feeling of the Committee that the present handling of the grandfather problem by the Committee on Clinical Certification is adequate.

4. The Committee supports the suggestion of the Chairman of the Committee on Clinical Certification that information regarding certification requirements (including pre-registration) be prepared and circulated.

Moved by Kopp and seconded by Wells that the report of the Committee on Clinical Standards in Speech be accepted. Passed.

Recessed at 11:30 a.m.

November 16, 1955, 2:10 p.m.

The meeting was reconvened and called to order by President Bloomer.

The same officers and members of the Council were present as at the first meeting, plus Jon Eisenson who had arrived at noon.

Report of the Committee on Clinical Standards in Hearing. Gaeth presented the following report for his committee:

During the past year the Committee has focused its attention on two problems. The group, which made up the Committee until January 1, 1955, continued to consider the problem of examinations for Certification in Hearing. The new Committee has dealt with matters of certification referred to it by the Chairman of the Committee on Clinical Certification.

The work of the Committee has been carried on mainly by correspondence. However, a meeting was held of the members present at the St. Louis Convention, and the Chairman has had occasional discussions with some of the Committee Members at various times.

1. Examinations for Certification in Hearing. The Committee reaffirms its belief in the principle of examinations as requisites for Advanced Certification in Hearing. The Committee believes an examination procedure should be established which is conducive to stability in the examination process. The Committee recommends the following procedure:

a. That an Examining Board of nine members, who hold Advanced Certification in Hearing, be established to prepare, conduct, and grade such examinations as are specified or permitted for Certification in Hearing.
b. That the members of the Board be nominated and elected by mail ballot by holders of the Advanced Hearing Certificate.
c. That the period of service on the Board be in units of three years and that the periods be staggered so that three members are elected each year.
d. That the term of service for members of the Board expire as soon after the Convention as practical, but that new members of the Board begin service about 10 days prior to the Convention.
e. That the Secretary of the Association be responsible for the conduct of an election as soon as possible and annually thereafter.

f. That the Examining Board handle those applicants referred to it by the Committee on Clinical Certification and that the Examining Board give its reports to the Certification Committee.
g. That the Examining Board work out the details of examinations, being guided by the requirements for Certification.
h. That the Board make an annual report to the Council and the Association.

2. Problems of Certification. The Committee has handled several requests from the Chairman of the Certification Committee for opinions on 'atypical' cases.

The Committee has no recommendations for changes in the standards at the present time.

Moved by Matthews and seconded by Doerfler that the report be accepted. Passed.

Moved by Wells and seconded by Matthews that: recommendation designated 1(a) in the report be approved; recommendation 1(b) be approved when changed to read, 'That the members of the Examining Board be recommended by the Committee on Committees to the Council and serve as a sub-committee to the Committee on Clinical Certification'; recommendation 1(c) be approved; recommendation 1(d) be disapproved; recommendation 1(e) be disapproved; recommendation 1(f) be approved; recommendation 1(g) be approved; and recommendation 1(h) be disapproved. Passed.

Report of the Special Committee on Group Insurance. Morris reviewed the nature of Group Life Insurance and Group Accident and Health Insurance and cited advantages in rates and coverages for a group such as the ASHA in which over three fourths of the members are estimated to be under the age of 45. Additional information is needed both from the Membership and the Insurance Companies before any specific plan or plans can be recommended. Morris recommended that someone be authorized to secure from the Membership information needed in order to further investigate the practicality of Group Life Insurance and Group Accident and Health Insurance, and further, that the person designated be authorized to poll the membership regarding interest in such specific plans as he may determine.

Moved by Powers and seconded by Matthews that the report be received. Passed.

Moved by Powers and seconded by Backus that the Committee on Group Insurance be continued and charged with the responsibility of carrying out the recommendations in its report. Passed.

Report of the Committee on Nominations. Powers presented a slate of nominees for Council consideration.

Moved by Powers and seconded by Kopp that in consideration of the report of the Committee on Nominations, the following individuals be presented to the Membership for election:

President-Elect: Raymond Carhart, Ernest Henrikson
Vice-President-Elect: Virgil Anderson, Paul Moore
Secretary-Treasurer: George A. Kopp
Councilor-at-Large: Mamie Josephine Jones, Alice H. Streng
Councilor-at-Large: T. D. Hanley, Charlotte Wells
Chairman of the Committee on Clinical Certification: Ruth Beckey Irwin
Chairman of the Committee on Ethical Practice: Frederic L. Darley, Lester Hale

Passed.

Report of Special Committee on Association Planning. Steer summarized the main topics of his report which included: chronology of activities of the committee; membership growth; problem of Executive Secretary and National Headquarters; organizational structure; problem of certification; review of publication problems; fiscal problems; administrative problems related to organization of committees; nomination and election of officers of the association; intensive Institutes; establishment of new committees; other important matters, including recruitment, continuous codification of official actions, directory listing of state associations, uniform reporting by state departments responsible for speech and hearing programs, status of state and local associations, and planning committee budget.

Meeting recessed at 5:30 p.m.

November 16, 1955, 8:05 p.m.

The meeting was reconvened and called to order by President Bloomer.

The same officers and members of the Council were present as at the afternoon session.

Report of the Terminology Committee. President Bloomer read a letter he had received from the Chairman of the com-

mittee, Kenneth S. Wood, who will be on leave of absence in Norway from September, 1955 to August, 1956 on a Fulbright Lectureship. Wood mentioned that the Terminology Committee had revised the speech correction terms in the McGraw-Hill publication, 'Dictionary of Education' and that he would resume his committee work when he returned from abroad.

Moved by Kopp and seconded by Ainsworth that the letter be received as a report. Passed.

Report of the Committee on Honors. In consideration of the report of the Committee on Honors presented by Carrell, the Council awarded the Honors of the Association to Grant Fairbanks and approved the following members for Fellowship: Oliver Bloodstein, Mrs. William Watson Davison, Frederic Darley, Jacqueline Keaster, Hayes Newby, Joseph Sheehan, and Dorothy Sherman.

Moved by Backus and seconded by Ainsworth that descriptive accounts and bibliographies be prepared for each person who is presented for Fellowship. Passed.

Report of the Planning Committee (continued). Moved by Hale and seconded by Irwin that the report of the Planning Committee be received with honorable commendation and that the Council proceed to consider the individual recommendations in it. Passed.

Moved by Backus and seconded by Curtis that the Membership Committee be given the responsibility of maintaining membership growth curves and extrapolations. Passed.

Moved by Peterson and seconded by Matthews that the recommendation to determine the possibility of obtaining subsidization for the purposes of employing an Executive Secretary and establishing National Headquarters be referred jointly to the Budget Committee and the Committee on the Establishment of a National Office. Passed.

Moved by Peterson and seconded by Carrell that the recommendation that the Council encourage the Committee on Membership to investigate the possibilities of stimulating membership growth be referred to the Membership Committee. Passed.

Moved by Peterson and seconded by Carrell that the recommendation that the Council take appropriate action to ascertain the wishes of the members of the Association with regard to the possibility of increasing dues in order to provide the extended services that a paid executive and national headquarters would make possible be referred to the Budget Committee. Passed.

Moved by Peterson and seconded by Powers that the recommendation that the Council encourage the Committee on Publications to investigate the feasibility of accepting appropriate paid advertising and the probable revenue to be realized from paid advertising be referred to the Committee on Publications. Passed.

Moved by Powers and seconded by Wells that the recommendation that the Council encourage the Ad Hoc Committee on the Establishment of a National Office to assemble and evaluate, with reference to our own needs, the actual experience of other organizations, such as the American Psychological Association, the American Physical Therapy Association, and the International Council for Exceptional Children, in establishing national headquarters be referred to the Committee on the Establishment of a National Office. Passed.

Moved by Powers and seconded by Wells that the recommendation that the Council encourage the Ad Hoc Committee on the Establishment of a National Office to make an analysis of the duties and responsibilities of the proposed Executive Secretary of the Association, and on the basis of this analysis to make recommendations concerning the qualifications which should be possessed by the individual employed and the level at which the salary should be placed be referred to the Committee on the Establishment of a National Office. Passed.

Moved by Wells and seconded by Powers that the recommendation that the Council take the necessary action leading to the setting up of an organizational plan which would provide for the affiliation of state organizations and special interest organizations with the ASHA be referred to the Committee on Organizational Structure. Passed.

Moved by Hale and seconded by Ainsworth that the recommendation concerning administrative problems related to organization of committees be referred as information to the Committee on Committees.

Moved by Curtis and seconded by Peterson to amend the motion by striking out the words 'administrative problems related to organization of committees' and inserting the words, 'the geographical distribution on committees.' Passed.

TABLE 1. Analysis of action completed on applications for clinical certification between January 1, 1952 and October 15, 1955.

Total number of certificates granted			1426
Automatic certification		725	
BS	448		
BH	44		
AS	193		
AH	40		
Certification by Committee		701	
BS	430		
BS Prov	85		
BH	27		
BH Prov	2		
AS	113		
AH	17		
Dual	14		
Spon. pr.	13		

The main motion as amended was passed.

Moved by Peterson and seconded by Matthews that the recommendation concerning the continuity of membership on certain committees and the recommendation pertaining to the dates that a committee begins and ceases to function be referred to the Committee on By-Laws. Passed.

Moved by Peterson and seconded by Irwin that in consideration of the recommendation of the Planning Committee, and the interest of the Council in the establishment of intensive institutes, a special committee be appointed to study the problem of special institutes to be operated in conjunction with the convention programs; to analyze the problems involved; and to make specific recommendations concerning how intensive institutes should be presented. Passed.

Moved by Carrell and seconded by Curtis that the recommendation that a special committee to monitor state and federal legislation be appointed, be approved. Passed.

Moved by Curtis and seconded by Ainsworth that the recommendation that the Committee on Membership join with the Committee on Publications for the purpose of preparing a pamphlet to be used to recruit young people into the profession be approved and that these committees be instructed to submit the manuscript to the Council for its approval. Passed.

Moved by Ainsworth and seconded by Curtis that the recommendation that a special committee be appointed to begin the construction of a manual of administrative policies and procedures composed of the past actions of the Association and the By-Laws be approved. Passed.

Moved by Powers and seconded by Curtis that the recommendation that an *Ad Hoc* committee be appointed composed of state Directors of Speech and Hearing programs to indicate to the ASHA the desirability of trying to develop a uniform reporting procedure with a view to annual publication of nationwide statistics dealing with the speech and hearing programs in this country be approved. Passed.

At the request of President Bloomer, Vice-President Carrell assumed the chair and asked for the report of the Committee on Clinical Certification.

Report of the Committee on Clinical Certification. Wells called attention to her written report, which is printed in full below, and enumerated the items for which she requested Council directives, interpretations, and actions.

1. Applications Received and Action Taken. Since January 1, 1955, when the office of the Chairman of the Committee on Clinical Certification moved from the campus of Pennsylvania State University to that of the University of Missouri, 173 new applications for certification have been received and about 150 certificates have been issued. All applications that had been referred to the *ad hoc* committee were returned to the Certification Office with recommendations or for completion of processing and have been included in the totals shown in Tables 1 and 2. These tables indicate the number of certificates granted from the time of the reorganization of the Association to October 15, 1955 and the applications now in the 'active' files in the Certification Office.

2. Other Activities of the Chairman of the Committee.

A. The Chairman, with the help of the Assistants employed, carried on correspondence with applicants for certification, wrote to members of the Certification and Standards Committees, responded to requests for information about certification from individuals and organizations, and maintained the files and records of the Committee.

B. Certification application forms, revised just prior to January 1, 1955 by Dr. McDonald and the 1955 Chairman, were printed and put into use. These new forms proved to be quite satisfactory and eliminated many of the problems brought about by lack of specific data obtained by the old forms. In addition, the Chairman assisted in the preparations of statements of certification standards and procedures for publication in the 1955 Directory of the Association.

C. The Chairman has continued to work with the Standards Committees in evaluating the standards now in effect for clinical certification. Some modifications may be recommended to the Council at the 1955 convention.

D. The Chairman has corresponded with members of the Planning Committee about problems that concern certification, making

TABLE 2. Analysis of applications in active file of Committee on Clinical Certification on October 15, 1955.

Total number of active applications		661
Granted Basic Provisional certification, accumulating experience for Basic	84	
Granted Basic, accumulating experience for Advanced	54	
BS, exp. for AS	50	
BH, exp. for AH	2	
Dual, exp. for Adv.	2	
Granted Basic, now applying for other	41	
Applying in Speech	32	
Applying in Hearing	9	
Granted Sponsor Privilege, accumulating experience for Advanced	10	
In Speech	10	
In Hearing	0	
Applications being held for information requested	124	
Applications being held for removal of deficiencies reported to applicants	165	
Applications now being processed		183
By Cert. Office	30	
By Cert. Comm.	125	
BS	29	
BS Prov.	52	
BH	2	
BH Prov.	2	
AS	23	
AH	2	
Dual Basic	3	
BS-BH Prov.	3	
BH-AS	3	
Dual Adv.	1	
Sp. Pr., Sp.	3	
Sp. Pr., H.	2	
By Standards Comm.	5	
Speech	3	
Hearing	2	
By Ethics Comm.	1	
By Council	22	

some suggestions and presenting some of the more serious problems.

E. The Chairman has corresponded with other members of the Committee on Certification by Institutions.

F. The Chairman has reported, to the Secretary-Treasurer, the monthly expenditures of the Committee. An analysis of these expenditures appears as section 5 of this report.

G. The Chairman has submitted, to the Secretary-Treasurer, the fees sent in for certification. A report of the amount of fees collected and transmitted appears as section 6 of this report.

3. The Activities of the Assistants to the Chairman.

A. During the period from January 1, 1955 to July 1, 1955, Mrs. Helen Kreigh, as Assistant to the Chairman, prepared the applications received for transmittal to Committee members, made the preliminary evaluations of the applications, took care of the correspondence that could be handled routinely, maintained the files and records of the Committee, and prepared many of the reports submitted. Mrs. Kreigh also worked out a helpful outline of the procedures to be followed in certification for the information of the Assistants who succeeded her.

B. Between July 1, 1955 and August 15, 1955, William Griffiths served as Assistant to the Chairman, continuing the work that Mrs. Kreigh had been handling and working with Mrs. Lois Kuhr in a review of all folders and materials in the files of the Certification Office.

C. Since July 1, 1955, Mrs. Lois Kuhr has served as Assistant to the Chairman, first making a thorough study of the contents of the 1200 folders of applicants for certification and bringing to light a number of problems that needed solution. As a result of this review, the Committee has been able to reactivate the applications of many of those whose certification had been delayed because of lack of information or because of pending changes in standards. Since August 15, Mrs. Kuhr has continued the general activities of the Assistant to the Chairman and will attend the 1955 convention to work at the Certification Information Desk that will be maintained there to provide information about certification to those attending the convention.

4. General Observations about Certification.

A. As the backlog of applications has been cleared away, the procedures have gone fairly smoothly. The chief difficulties are those posed by Members whose academic work was completed several years ago and who have been working as speech therapists or hearing therapists without pre-registering or reporting any of the professional experience for which they might have been credited. The applications of those who have completed their training within the past few years are more easily processed and usually represent training and experience that is acceptable and can be credited without undue correspondence and checking.

B. Members of the Committee on Clinical Certification have made a real effort to review carefully the applications sent to them and to send them on as rapidly as possible. In some instances, undue delays have occurred. The Members of the Association should have an explanation of the intentions of the Committee and should understand the problems that sometimes prevent rapid action on their applications. Some of these problems are: lack of complete application materials, lack of proper signatures on applications and reports, lack of clarity in course listings for comparison with transcripts, failure to obtain an eligible sponsor, confusion in course content as represented by course titles (particularly in the content required in metal hygiene and in child development).

C. The evaluations made by members of the Committee differ in many instances. However, the Chairman has usually been able to resolve these differences and work out a majority decision from the reports made by Committee members. Consideration of individual problems is essential, since, if objective and competent judgments are not needed, then the work of the Committee could be done by a competent secretary and an adding machine.

D. The provisions made by the Council for application under the extended 'grandfather' provision have been well received by the Membership and many of the certificates issued during this year have been awarded on the basis of the 'grandfather' provision.

E. The principle approved by the Council at the 1954 convention for those who wish to request dual certification under the 'grandfather' provision by showing evidence of professional activity in both Speech and Hearing has not been invoked by many of

TABLE 3. Analysis of expenditures of the Committee on Clinical Certification for the period from January 1, 1955 to October 15, 1955.

Amount allotted to Certification Committee			$3,500.00
Expenditures			2,495.59
Wages		$2,111.20	
Withheld for salaries	$1,500.00		
Sent to Secretary-Treasurer	600.00		
Paid to extra secretary	11.20		
Supplies		93.05	
Envelopes and postage		201.51	
Printing		84.25	
Phone		5.58	
Balance on hand, October 15, 1955			1,004.41
Estimated expenditures to December 31, 1955			450.00
Travel (Assistant to convention)		225.00	
Materials for convention desk		25.00	
Supplies		50.00	
Printing		75.00	
Postage		75.00	

the members. Only one such application has been processed this year.

F. Training institutions and Members who serve as sponsors have shown general interest in maintaining the standards set by the Association. However, in some few instances, sponsors have apparently neglected to make a thorough check on the materials sumbitted to them for signature. Some form of 'sponsor education' seems advisable.

G. The present Chairman of the Committee concurs with the statement of non-procedural problems made by the former Chairman and presented in the report of the Committee to the 1954 convention. (See items *a* through *d* in Section 4 of the Report of the Committee on Clinical Certification, page 116 of the *Journal of Speech and Hearing Disorders* for March, 1955.)

5. Analysis of Expenditures (See Table 3).

6. Certification Fees Received and Transmitted. Those who have submitted application since January 1, 1954, have been liable for the certification fee of $15.00, half of which is paid when the application is sent in and the other half of which is paid when the certificate is issued. Between January 1 and October 15, 1955, the Certification Office has sent to the Secretary-Treasurer a total of $1658.00 in certification fees.

7. Recommendations.

A. The Provisions in the Association's budget should be continued to enable the new Chairman of the Committee on Clinical Certification to obtain good Assistants. If additional budget allowances seem needed to provide for secretarial help, these should be made.

B. The membership of the Committee should be enlarged to provide for more rapid evaluation of the applications without asking too much time from any one Committee member. The number of applications in the Speech area indicates that the increase in the number of members on the Committee should be chiefly in those who will act on applications for certification in Speech.

C. The suggested procedures (see 1953 Convention Minutes) for rotation of Committee members should be carried out. The Committee needs experienced members, but, because of the amount of time that Committee service entails, the Association should not expect any one member to continue to serve on the Committee indefinitely.

D. Members of the Committee should meet, at some time and place suitable, to discuss all of the procedures for certification. Such a 'training session' should probably not be held at the annual convention, since pressure of responsibility, particularly for the Committee Chairman, precludes a successful meeting at such a time. Funds allocated for a meeting of the Committee for explanation of certification procedures and discussion of the standards would be well spent.

E. Subscription to the new (1951) Code of Ethics should again be part of the certification procedures. A copy of the Code should be sent to each applicant and

he should be asked to indicate his willingness to subscribe to the Code. This practice was abandoned when new application forms were prepared, but a statement of the subscription requirements remains in the standards and the Code is now sent to each applicant.

F. Although the next Chairman of the Committee will be appointed, according to the Constitutional provision for a term of four years, the present Chairman urges consideration of the appointment of a Chairman-elect one year prior to the time that person assumes the chairmanship. Continuity in the Certification Office is most desirable, since time lost in the transfer of records from one place to another and in the inevitable period of 'settling in' by the new Chairman makes for many problems and for understandable dissatisfaction on the part of those whose applications are delayed.

G. As the number of applications for certification increases, the problems of handling Council lists and issuing certificates will become greater. The Committee may wish to consider recommending that certificates be issued only twice or three times a year. At the present time, Council lists go out about once a month and certificates are issued as soon after the deadline for Council approval or rejection as possible. This makes for much repetitive clerical work that might be avoided if certificates were issued at less frequent intervals. The Membership would have to be informed of any change in policy such as this, but the present Committee Chairman recommends consideration of it as a procedural time-saver.

H. The provision of a Certification Information Desk at the annual convention should be continued if that Desk can be staffed by trained personnel who can give out accurate and helpful information.

I. Every effort should be made to keep the Membership informed of the work of the Committee and of its accomplishments. Dissatisfactions and complaints are inevitable and often are justified, but information to Members can do much to forestall problems and to improve the morale of applicants. In addition, the Committee Chairman should attempt to make the explanations and directions sent to applicants as clear and comprehensive as possible so that the application materials submitted will be adequate and the delays involved in the return of incomplete or inaccurate materials will be avoided.

J. The Chairman of the Committee on Clinical Certification must necessarily devote a great amount of time to certification matters. Competent direction of the program of certification is almost impossible for anyone carrying a full-time load of teaching and clinic direction or clinic work. The Committee on Committees, in selecting the Chairman of the Certification Committee, may wish to keep this serious problem in mind.

K. Within a year or so, the Association should study carefully the entire picture of certification as it has developed during the period following the reorganization of the Association. The value of certification should be weighed against the problems it evokes and some conclusions should be reached about the advisability of continuing the certification process in its present form and with its present committee set-up.

Moved by Matthews and seconded by Kopp that the report be received with commendation. Passed.

Each of the recommendations included in the report, as well as several items not included in the report, were discussed and interpretations were given. Only one formal action was taken.

Moved by Wells and seconded by Matthews that the Council instruct the Chairman of the Committee on Clinical Certification to interpret the word 'file' in action taken on certification fees to mean the date on which the application materials are filled out by the applicant and are received in the office of the Committee on Clinical Certification. Passed.

Report of the Committee on Ethical Practice. Backus expressed a hope that the Council had read her report because she had included in it the philosophy which was basic to the recommendations made. The report contains two parts: Part I presents the activities of the committee during the past year under the headings investigation of unethical practice and promotion of ethical practice; Part II presents an analysis of function with recommendations regarding structure of the committee, with subdivisions dealing with evaluation of committee functioning, basic assumptions about ethical practice, conceptions of committee function, and recommendations. Recommendations were made in respect to: enlargement in function; modification in structure; and specification regarding procedures.

Moved by Bloomer and seconded by Ainsworth that the report be received and that the items of recommendation in the report be referred to the incoming Committee on Ethical Practice for study and guidance with respect to its procedures. Passed.

President Bloomer resumed the Chair.

Adjourned at 1:25 a.m.

November 18, 1955, 7:40 p.m.

All officers and members of the Council were present with the exception of the Editor of the Association, West, who was unable to attend the convention.

President Bloomer called the meeting to order and enumerated the unfinished business before the Council.

Report of the Committee on Speech Correction Fund. The Council considered the following written report which had been submitted by the committee chairman, Wendell Johnson:

The following financial report represents the activities of the Speech Correction Fund Committee covering the period from Sep-

TABLE 4. Analysis of Speech Correction Fund from September 1, 1954 to September 30, 1955.

Fund Balance, September 1, 1954			$4,430.34
Cash Receipts:			
1. Contributions from Kappa Delta Phi			
January 31, 1955	$1,000.00		
June 13, 1955	1,000.00	2,000.00	
2. Royalties from Grune & Stratton (*Speech Problems of Children*)			
September 21, 1954	171.00		
March 24, 1955	104.25		
September 26, 1955	117.38	392.63	
3. Other Receipts			
September 20, 1954—John P. Reid	100.00		
September 20, 1954—Malcolm Fraser	10.00		
September 23, 1954—Laura S. Bodine	1.00		
September 24, 1954—Dorothy G. Kester	10.00		
October 4, 1954—Howard J. Beatty	10.00		
October 13, 1954—Louise Davison	10.00		
October 13, 1954—Hildred Schuell	10.00		
November 12, 1954—Wendell Johnson	25.00		
January 24, 1955—Sigma Alpha Eta	25.00		
April 4, 1955—Agnes B. Black	5.00		
April 28, 1955—Earl Howell—Sigma Alpha Eta	12.00		
May 25, 1955—Wendell Johnson	5.00	223.00	
Total Cash Receipts		$2,615.63	
National Society Contribution			754.32
TOTAL FUNDS AVAILABLE			$7,800.29
Expenditures:			
1. Scholarships			
February 9, 1955—Frank Falck	500.00		
February 9, 1955—Anthony Bowie	500.00		
June 17, 1955—Mark Larson	500.00		
June 17, 1955—Joseph Chaiklin	500.00		2,000.00
2. Supplies & Services			
*Staff Time—Clerical, Fund Adm. Costs	719.26		
Supplies—Photostats, paper, postage, etc.	35.06		754.32
TOTAL EXPENDITURES			$2,754.32
NET BALANCE IN FUND, Sept. 30, 1955			$5,045.97

*Represents 3/8 of a day per week for clerical and professional staff time.

tember 1, 1954 to September 30, 1955. The fund balance at the beginning of the year was $4,430.34 and at the end of the period it was $5,045.97. Kappa Delta Phi approved another $2,000 grant to the fund and it will be received by the committee at such time or times as the committee awards the Kappa Delta Phi scholarship for which the grant is intended. The available balance as of September 30 was, therefore, $7,045.97.

Since September 1, 1954, the committee has awarded four $500 scholarships as indicated in the financial section of this report (see Table 4). An announcement of awards to become effective in January or February was prepared and distributed to approximately fifty colleges and universities offering training in speech pathology at the graduate level, all officers, council members, and Fellows of the American Speech and Hearing Association, and 238 state and metropolitan Easter Seal societies.

A statement on policies for awarding scholarships appeared in the March, 1955 issue of the *Journal of Speech and Hearing Disorders*. Reprints are available and a number have been distributed to interested persons.

The Committee received word from Mr. Thomas Baird, attorney for Mrs. Edna Hill Young, that Mrs. Young had made the Speech Correction Fund a generous bequest in her will. A number of donations were received as a result of the statement on the Speech Correction Fund which was distributed in August, 1954.

The additional inquiries and applications for Speech Correction Fund scholarships that have been received since the distribution of the announcement in August, 1955, also point up the effect of continuing publicity. Again we encourage members of the American Speech and Hearing Association to lend their support to the Speech Correction Fund by (1) giving prospective donors essential information about the Fund, and by directing worthy students to the Fund as a source of scholarship aid; (2) remembering the Fund in their own contributions budgets; and (3) disseminating information about it to new members of the profession and to the public on appropriate occasions and in a dignified and constructive spirit.

The Speech Correction Fund Committee has enjoyed in the year now ending, as it has in past years, the benefits of enlightened cooperation and support by the National Society for Crippled Children and Adults. Representatives of NSCCA who have been officially appointed to work with the Committee are Miss Jayne Shover, Mr. Raymond L. Kahn, and Mrs. Cora Leukhart, who serves as Secretary of the Committee. The Committee is sensitive to the advantages to all concerned of this cooperative relationship between ASHA and NSCCA, and is grateful to all those who are responsible for it.

The Committee recommends the continuation of a Speech Correction Fund Committee with present functions and policies.

Moved by Kopp and seconded by Powers that the report of the Committee on Speech Correction Fund be received with commendation. Passed.

Report of the Special Committee on Revision of the By-Laws. Curtis stated that the committee had no written report. Moved by Kopp and seconded by Wells that the statement be received. Passed.

Report of the Special Committee on Establishment of a National Office. Silverman reported as follows:

The rapid postwar increase in membership and the major changes in structure of the American Speech and Hearing Association have been accompanied by a proportionate increase in the demand for services that can be rendered by the Association. Details about the rate of growth of the Association and projection for the future are available elsewhere and need not be reviewed here. It is likely that the increased membership will require expansion and/or intensification of association activities, particularly in the areas of management, publication, certification, liaison with other groups, and ethical practice. Among the mechanisms that have been suggested to satisfy these requirements has been the establishment of a national office. Our committee understood that the concept of a national office implied a paid staff operating from a rather permanent geographical location. Our purpose was to explore the feasibility of the establishment of such an office.

The committee functioned through correspondence among its members and with other sources of information such as the National Education Association, International Council of Exceptional Children, and, fortunately, it was able to hold one meeting on July 27, 1955 at Ann Arbor, Michigan. Present at the meeting were committee members Henrikson, Kopp, and Silverman, President Bloomer and by invitation, Editor of the *Journal* Peterson. Since Silverman

was scheduled to lecture at the University of Michigan July 27, it was an opportune time to call a meeting. The items reported below are the result of the deliberations at the Ann Arbor meeting. (In addition, the chairman had an opportunity to talk with Chairman Steer of the Committee on Association Planning.)

The Need for a National Office. We feel strongly that a national office is needed if the Association is to realize its maximum potential. We stress the concept of potential because we believe that a national office is not desirable merely for providing existing services but it can seek out and develop promising areas of activity where volunteers have either functioned inadequately or not at all. Among these are our relation to other public and private agencies and to related professional groups. For example, the U. S. Office of Vocational Rehabilitation joined recently with the American Hearing Society in sponsoring a conference on hearing rehabilitation. We sent a delegate but we believe if adequate relations existed between the ASHA and the Office of Vocational Rehabilitation we would have been included as a sponsor.

We think that a national office may relieve persons holding certain offices and committee posts of an unreasonable demand on their time. We are not unmindful that serving the Association is an obligation of membership and, furthermore, that the experience gained thereby contributes to professional growth. Yet, a properly oriented national executive could conceivably retain all the advantages of voluntary participation without burdening particular individuals. He could be on the alert for promising talent and he could suggest appropriate assignments of responsibility. The quality, the efficiency, and the breadth of participation in the affairs of the Association could be upgraded and enhanced by the existence of a national office.

Our membership is likely to be better served by a national office in such activities as promptness in clerical processing of applications for certification and membership, in personnel placement, and in other services. We must continue to emphasize, however, that we are also serving our membership constructively and with greatly needed continuity when we meet the needs related to liaison and participation in Association affairs described above. The Association is not an abstraction; it is composed of individuals with a common professional and scientific purpose and it is worthy of the best representation at a time when it must compete with increasingly sophisticated efforts to get the attention of organized public and private groups and the public at large.

The Problems of Establishing a National Office. The major problems concerned with the establishment of a national office are the cost and the personnel, both of which are obviously related. It is convenient for us to discuss the executive first. We believe that a significant hazard related to the establishment of a national office is the procurement of a satisfactory executive since, in a sense, we are placing most of our eggs in one basket. This one person will *be* the profession to the many groups that we envision he would contact. We shall be looking for a combination of personality and competence that is rare and expensive, and a poor choice may lose for us a great deal of precious ground that we already hold. We believe, for example, that we should aim higher than the $9,000 salary suggested tentatively by the Committee on Association Planning.

We turn now to an analysis of the present financial operation of the Association. Our figures are based on projected income and disbursements for 1955 and perhaps for 1956. In general, the fiscal activities of the Association can be divided into two main areas: (1) Publications and (2) Office Management and Certification.

1. Publications: The Committee was informed by the Secretary-Treasurer that the Interstate Printers and Publishers have asked for a review of our contract that has not changed since 1948. We are certain that we must look forward to substantial increases in costs of producing our publications. Incidentally, previous 'shopping around' revealed that we had an extremely favorable value in our contract with Interstate. From figures furnished by the Secretary-Treasurer, our analysis showed that the publication operation could anticipate an income of roughly $21,500 and disbursements of $37,000 per annum for the coming year or two (allowing for an increase in costs in a new contract). This, sad to relate, yields a *deficit* of $15,500.

2. Office management and certification: This phase of the Association's operation may reasonably expect an income (from dues, the convention, and certification fees) of $17,500, with disbursements (Secretary's office, certification, national officers and the

convention) of $13,500, resulting in a 'surplus' of $4,000.

The net deficit, therefore, of the entire operation of the Association may be as much as $11,500 for the coming year. *Actually, we are confronted with the prospect of maintaining our present financial status before we even consider a national office.* However, this problem is not within the purview of our committee. Nevertheless, we are charged with specifying the conditions under which we could establish a national office. The major condition, obviously, is to improve our financial position by increasing our income. The possibilities for consideration by the Council are the following: (1) Increase dues; (2) Increase membership; (3) Increase fees for certification. The committee was amazed to learn the extent to which the certification operation was being subsidized by the membership; and (4) Charge for publication in the *Journal*. The Editor, who was present at our meeting, may make some suggestions about this possibility.

When we considered the types of functions to be served by a national office and when we allowed for contributed space, facilities, and service now rendered to the Association we find that a realistic budget for a national office would range from $20,000 to $25,000 per year. If we consider our present projected deficit, it means that to establish a national office we need a minimum increase of 75 to 100% in income. If we achieve this through an increase in membership, we must, of course, allow for increase of disbursements in serving new members. The first would not be proportional because many of our costs are and would be fixed. If we continue to grow at the rate projected in the 1954 report of the Committee on Association Planning, we may look forward to attaining this goal about 1960.

Because of the unfavorable financial situation, we did not consider such matters as location of a national office, amount of space needed, etc. We did make inquiry about space in the new building of the National Education Association (Washington, D. C.) and we learned that space may be available free of charge to departments of the N.E.A. but there is no great likelihood that we would be eligible unless we chose to affiliate with N.E.A. The policy of N.E.A. has not yet been definitely formulated.

We considered alternatives to a national office that the Council may wish to consider. Among these are: (1) To affiliate with another group, for example S.A.A., and share the services of an executive. We do not look with favor on this alternative; and (2) Pay a part-time assistant to the Secretary-Treasurer to free him for high level functions. We suggest this for Council consideration; we have no fixed view about it.

Conclusions: (1) A national office would be useful to the Association; (2) A national office worthy of the Association's purposes and activities would require an annual budget of between $20,000 and $25,000; (3) Our present financial situation precludes the establishment of a national office at this time, 1955-56; (4) We need to increase our income by 75 to 100 per cent in order to establish a national office; and (5) We may be in a position to establish a national office about 1960.

Moved by Matthews and seconded by Powers that the report be received. Passed.

Discussion was focused on the suggestions for increasing the income of the Association. Because the Council had acted on these suggestions as they had been included in the report of the Planning Committee, no formal action was indicated here.

Report of the Sub-Committee, of the Committee on Clinical Standards in Speech, on Public School Speech Therapy. Ruth Irwin called attention to the fact that her committee had been appointed late in the year and not enough time had elapsed since the approval of the committee to do much more than explore the topics which needed study and the possibility for solutions of those problems. Her report included a list of the topics discussed and recommendations that the committee be continued and expanded.

Moved by Powers and seconded by Kopp that the report be received. Passed.

Discussion centered on the duties and responsibilities of this committee. It was agreed that the primary function of the committee should be the formulation and recommendation of Standards to be used in the certification of Public School Speech Correctionists.

Report of the Special Committee on Organizational Structure. Irwin stated that his committee had been instructed to sample the opinion of members of the ASHA on the present organization of the Association

and also, the attitude toward the proposed organization of the ASHA as published in the March, 1955 issue of the *Journal*. His committee prepared three documents including, a covering letter, a questionnaire, and an extract of the organization plan proposed by the Planning Committee. These documents were presented to three State Associations and the returns were tabulated and presented as a supplement to the written report dated October 15, 1955. Irwin summarized the trends that his committee believed to be significant and recommended that the committee be continued and instructed to review immediately the organizational structures of organizations similar to the ASHA; to review immediately the composition of state organizations which might become affiliated; to study the number of special interest groups that might be expected to be represented; to formulate in detail a specific plan and submit this specific plan, on a close working arrangement, to at least two to four state organizations then, at the next Council meeting it could be presented as a detailed plan which would be compatible with other oranizations which presumably have the support of representative state organizations.

Moved by Powers and seconded by Kopp that the report be received. Passed.

Moved by Matthews and seconded by Powers that the Council endorse the specific recommendations in the report. Passed.

President Bloomer stated that it was the opinion of Council that this committee should not regard itself as being instructed to work toward the plan of the Planning Committee but rather it should devise and recommend the best possible plan for the Association.

Report of the Ad Hoc Committee on Insignia. Montgomery indicated in his written report that his committee had not had time to complete its assignment and made recommendations for the continuation, expansion, and publicizing of the committee.

Moved by Kopp and seconded by Curtis that the report be received. Passed.

Moved by Powers and seconded by Kopp that the committee be continued another year. Passed.

Report of the Ad Hoc Committee to Study Problems of Certification at Training Centers. The Council considered the following written report submitted by Gaeth, Chairman of the Committee:

The Committee conducted its business through correspondence and by meeting at the time of the Los Angeles convention. Members of the Committee agreed that study of certification by training centers could not properly be considered until the process of certification has been more carefully evaluated and has become stabilized. Hence, the *ad hoc* Committee to Study Problems of Certification at Training Centers makes the following recommendations:

1. That the procedures for certification now in effect be continued for the present.
2. That the *ad hoc* Committee to Study Problems of Certification at Training Centers be replaced by a special committee whose purpose is to study the whole certification problem.
3. That this proposed committee be made up of (a) members who have had experience in certification, (b) members who have had experience in the development and administration of the standards for certification, and (c) a representative of the Council who has not served on the Committee on Clinical Certification nor either of the Committees on Standards.
4. That funds be appropriated to facilitate the following schedule: (a) A face-to-face meeting of members of the proposed committee; (b) A report by the proposed committee to the Council; (c) Council reaction to the report; (d) Committee consideration of Council reaction; (e) A second face-to-face meeting of the members of the proposed committee just prior to the 1956 Convention of the Association; and (f) Final recommendations to the Council at the 1956 convention.

Moved by Curtis and seconded by Matthews that the report be received. Passed.

Moved by Curtis and seconded by Powers that the sense of this Council is that it favors moving in the direction of institutional certification as rapidly as possible and that a *ad hoc* committee be instituted to investigate the feasibility and the ways of implementing this. Passed.

Report of the Committee on Committees. Carrell reported the recommendations for Committee Membership.

Upon motion duly made and seconded, the committees as presented and those members appointed to serve on such committees were accepted by the Council. (This report is presented in full following these minutes.)

Resolutions. In consideration of a portion of the report of the Committee on Honors,

the following Resolutions were approved by the Council:

Resolved: That the American Speech and Hearing Association express its deep sense of gratitude and admiration to Mrs. Edna Hill Young and Dr. Sara Stinchfield Hawk for their generous contributions to the Speech Correction Fund, jointly sponsored by our Association and the National Society for Crippled Children and Adults. Mrs. Young has named the Speech Correction Fund as a Beneficiary in her Will, and Dr. Hawk has provided in her Will for certain book royalties to be assigned to the Speech Correction Fund. Through these decisions of enlightened benevolence, Mrs. Young and Dr. Hawk have acted to extend indefinitely into the future the constructive humanitarian influences of their dedicated careers on behalf of the speech handicapped. We are inspired by their benevolence to devote ourselves ever more earnestly and effectively to the work and the ideals that have been and will long be honored by the noble devotion of Mrs. Young and Dr. Hawk.

Resolved: That the Association express its appreciation to Dr. George Kopp for the quiet, unassuming, effective central service he has provided for the membership; and for his dedicated guardianship of the Association's affairs during these unprecedented seven years of numerical growth and professional maturation.

Resolved: That the Association recognize and extol the thoughtful, sincere and helpful devotion to the difficult responsibilities of the Chairmanship of the Committee on Ethical Practice revealed in the service of its retiring Chairman, Ollie Backus. In this Committee, effective leadership such as that of Dr. Backus is essential to the continuing integrity of the Association.

Resolved: That the Association extend thanks to James Curtis for three years of contribution to the welfare of the Association through his devoted attention to his responsibilities as a member of the Council. As he retires from the Council it is expected that his sagacity and experience will be available to Council members of the future.

Resolved: That the Association express appreciation for the service during the current year of Lester Hale in filling the Council seat vacated by Stanley Ainsworth.

Resolved: That the American Speech and Hearing Association express its recognition and appreciation for the capable leadership through this year of the retiring President, Dr. Harlan Bloomer.

Resolved: That the American Speech and Hearing Association express its appreciation to the retiring Vice-President, Dr. James A. Carrell, for the impressive task he has accomplished in preparing the distinguished professional program of this Annual Convention.

Resolved: That the American Speech and Hearing Association record its sincere gratitude for the efficient planning and devoted effort of Dr. Elise Hahn and members of her Committee on Local Arrangements.

Resolved: That the American Speech and Hearing Association acknowledge its debt to Dr. Charlotte Wells who concludes her service as Chairman of the Committee on Clinical Certification, for the conscientious and sympathetic management of the affairs of that Committee.

Institute of Business Management. Moved by Carrell and seconded by Doerfler that the Secretary-Treasurer be authorized to affiliate with the Institute of Business Management. Passed.

International Association of Laryngectomees. Kopp presented the needs of the International Association of Laryngectomees, as contained in a letter from Mr. E. W. Tuescher, Executive Secretary of the Association.

Moved by Matthews and seconded by Kopp that the Council go on record as being sympathetic to the needs of the International Association of Laryngectomees and express a willingness to cooperate in working toward the solutions of their problems. Passed.

Moved by Powers and seconded by Matthews that the request to appoint a representative to serve on the National Advisory Committee with representatives of other agencies interested in the problems of the laryngectomized person be referred to the Liaison Committee with power to act. Passed.

Reprinting Sections of the Directory. Kopp requested authorization to have sections of the Directory reprinted to facilitate answering inquiries received in his office.

Moved by Matthews and seconded by Curtis that the Secretary-Treasurer be authorized to have reprints made of sections of the Directory. Passed.

Invitation from the International Association of Logopedics and Phoniatrics. Moved by Kopp and seconded by Powers that the Council express its appreciation for the invitation to send a delegate to their Gen-

eral Assembly and refer the matter to the Liaison Committee of the Association. Passed.

Adjourned 2:15 a.m.

Business Meetings

November 17, 1955, 8:20 p.m.

President-Elect Carrell called the meeting to order, welcomed the delegates to California and the West Coast, expressed his gratification that 962 persons had registered on the first day of the convention, and introduced President Harlan Bloomer who presented his presidential address. (An article based on this address appears in this issue of the *Journal*.)

President Bloomer assumed the chair, commented on the hospitality of the city of Los Angeles and the California Speech Therapy Association, mentioned the excellence of the program that had been arranged by Dr. Carrell and his commitee, and stated that the agenda of the meeting included reporting of certain aspects of business of the Council and the presentation to the Membership of a slate of officers, Council members, and Committee Chairmen. Before proceeding with the business on the agenda, he called to the platform and introduced each officer and Council member.

Minutes of the 1954 Convention. President Bloomer stated that the minutes of the 1954 convention were printed in the March, 1955 issue of the *Journal of Speech and Hearing Disorders*, and if there were no additions or corrections they would stand approved as printed.

Review of Reports of Officers. President Bloomer started the review of the reports of the officers by abstracting his report as President.

Executive Vice-President Ainsworth summarized the activities of his office which functioned primarily through two committees, the Committee on Time and Place and the Committee on Liaison.

Vice-President Carrell stated that he and his committee had arranged a convention program that contained 56 sectional meetings, some film exhibitions, and two Business Meetings. Of the Section Meetings, 29 were devoted to speech disorders; 16 to various aspects of hearing disorders; 4 to what might be grouped under the heading of experimental phonetics; and 7 to what might be called professional problems. Fifteen of the 29 papers on speech disorders were orientated toward therapy and diagnosis and 8 of the 16 hearing programs dealt directly with therapy or diagnosis. Other papers on speech correction and hearing could be classified as research papers. Carrell gave credit for the excellence of the program to the efforts, activities, and thoughts of the members of his committee.

Executive-Vice-President Ainsworth as Chairman of the Committee on Time and Place stated that the 1956 meeting will be in Chicago; the 1957 meeting is scheduled to be in Cincinnati, and that the pattern from 1958 through 1961 will be East in 1958; Midwest in 1959; West in 1960; and Midwest again in 1961. The exact locations are still to be selected by the committee and recommended to the Council.

Secretary-Treasurer Kopp summarized his reports as Secretary, Treasurer, Chairman of the Committee on Budget, Chairman of the Committee on Membership and Business Manager of the *Journal*.

President Bloomer explained the absence of the Editor of the Association West and summarized his reports.

Dues of Associates. President Bloomer explained the actions of the Council in recommending that dues for Associates be increased from $4.00 to $5.50.

Moved by Travis and seconded by Johnson that the Council action to increase the dues of Associates to $5.50 per year be approved. Passed.

Election of Officers, Councilors and Committee Chairmen. In consideration of the report of the Committee on Nominations, the Council presented the following slate of nominees to the Membership:

President-Elect: Raymond Carhart, Ernest Henrikson
Vice-President-Elect: Virgil Anderson, Paul Moore
Secretary-Treasurer: George A. Kopp
Chairman of the Committee on Clinical Certification: Ruth Beckey Irwin
Chairman of the Committee on Ethical Practice: Frederic L. Darley, Lester Hale
Councilor-at-Large from the first group: Mamie Josephine Jones, Alice H. Streng
Councilor-at-Large from the second group: T. D. Hanley, Charlotte Wells

President Bloomer explained the method of balloting and appointed the tellers: McKenzie Buck, Herold Lillywhite, Roger Maas, Frederick Murray, Morris Val Jones,

Marie Brittin, M. Lois Nagy, and Eleanor Taussig.

Balloting proceeded for each of the offices after a call for nominations from the floor. The following persons were elected:

President-Elect: Raymond Carhart
Vice-President-Elect: Virgil Anderson
Secretary-Treasurer: George A. Kopp (unanimous ballot)
Chairman of the Committee on Clinical Certification: Ruth Beckey Irwin (unanimous ballot)
Chairman of the Committee on Ethical Practice: Frederic Darley
Councilor-at-Large: Ernest Henrikson
Councilor-at-Large: Charlotte Wells

While the ballots were being counted, President Bloomer asked the Editor of the *Journal*, Peterson, to talk about the functions of his office. Peterson explained the nature of the *Journal*, its distribution, and the procedure used in processing manuscripts.

The President next called on the Chairman of the Committee on Clinical Certification, Charlotte Wells, who presented a report on the present status of clinical certification within an historical framework.

President Bloomer introduced the amendments to the By-Laws that had been approved by the Council by mail during the summer and read a statement from the authors of the amendments.

Because of the subsequent action taken by the Council and Members in respect to these proposed amendments, a detailed report of the actions taken at this Business Meeting are not presented here.

Adjourned at 10:50 p.m.

November 19, 1955, 2:15 p.m.

President Bloomer called the meeting to order and reported that the registration at the convention included 527 members, 454 non-members and associates; 147 students; and 43 guests, totaling 1,171 registrations. He stated that the ASHA was indebted to the support of the California Speech Therapy Association in helping to make this registration possible and expressed appreciation to the members of the Local Arrangements Committee, Robert Douglass, Victor Garwood, Esther Herbert, Mary Huber, John Moncur, and Elise Hahn, Chairman, for their contributions to the success of the convention.

President Bloomer called on Wendell Johnson to perform the first item of business on the agenda.

Johnson stated that: 'I have the extraordinary pleasure of saying a few words about some very, very kind acts of some very, very wonderful people.

'Several years ago, a number of stutterers decided that they wanted to do something to enable everyone interested to do what they could to develop the field of speech correction, and they acted to start what they call the Speech Correction Fund. It was adopted by the American Speech and Hearing Association and the National Society for Crippled Children and Adults.

'The latter office has provided us with a National Office for this fund and with secretarial help and with a great deal else that goes with establishing the kind of a total context within this operation so that it can be carried out. We do not carry on an annual fund-raising campaign. The idea is somewhat different. The idea was that it should be kind of a depository which would be available to anyone who had the motivation to contribute money to the support of work in our field. There was no depository of this type and since it has been established, we have had contributions of various types.

'The main one I would like to take a moment to tell you about is the status of the budget as it is now. The main contributions have come from Kappa Delta Phi. They have given us many thousands of dollars, and we find applicants for these scholarships. There have been some contributions from royalties of books on speech and the problems of children and there have been ten or twenty authors of these books who have contributed over the years by contributing the royalties to the fund, something in the neighborhood of roughly $3,000. There have been some contributions from the stutterers' clubs and from individuals and from Sigma Alpha Eta, and so forth. We have at the present time a total fund available of $7,800 and during the last year, we awarded four scholarships. There will be more awards during the year ahead.

'During the year, we were honored and very much heartened by the action of Mrs. Edna Hill Young who named the fund in her will and also, Dr. Sara Stinchfield Hawk acted to contribute to the fund a part of her will and the royalties that will be received from the book *Motokinesthetics*, published by the Stanford Press and also, *Children with Delayed Speech*.

'We are all inspired very, very much by people whom we can call dedicated. The council of the American Speech and Hearing Association has resolved formally to express its deep sense of gratitude to Mrs. Young and Dr. Hawk for their generous contributions to the Speech Correction Fund, sponsored by the American Speech and Hearing Association and the National Society for Crippled Children and Adults.

'Mrs. Young has named the Speech Correction Fund in her will and Dr. Hawk has provided in her will for certain book royalties to be assigned to the Speech Correction Fund. Through their benevolence, Mrs. Young and Dr. Hawk have acted to extend into the future constructive means for the humanitarian influence of their dedicated careers on behalf of the speech handicapped. We are inspired by their benevolence to devote ourselves ever more earnestly and effectively to the work and the details that have long been honored by the noble devotion of Mrs. Young and Dr. Hawk. We are privileged to present both of you, Mrs. Young, and Dr. Hawk, with these orchids.

Mrs. Young replied: 'I want to say a few words as long as I have the opportunity, so that you will have a little understanding of what this meeting means to me this afternoon. The thing which has come up within the last week is a surprise to me. The reason that I made this action perhaps, as you know, is that for thirty-five years of my life, my main objective has been to get people to see what there is in this motokinesthetic method. I haven't been sitting down and doing nothing, but I have been working to get people to understand. I don't think it is wasting your time when we consider what there is underlying this work. I don't think it is wasting time for me to say a few words to you today.

'Something very unusual happened to me that I never knew of any similar instance like it, but I am not going to go into that. It taught me something of the inner working of the human being and speech mechanisms and how an individual can be torn to pieces by these things, let's say. Often, there are things that come to light in one or two human beings and if I hadn't worked on it and if a few years from now you suddenly found about these things, I am sure you would feel that I had been remiss in not passing on to you and you wouldn't honor me. I found out something that I felt I owed to humanity to let this thing be known, but the things I found out were things that can happen to human beings that are not on the surface. They are hidden and deeply hidden. They don't come to light very often. That was my beginning.

'I kept working in various fields of speech disorders and working in a corner and never asking anyone to see how I was doing until I had worked out the system of these motokinesthetics. I know that I have friends who took a course from me twenty years ago and eighteen years ago and fifteen years ago and they worked that way very, very often, but let me say to you that we worked that way in a corner. We often asked ourselves why we couldn't prove these things and prove that they could be done. Now, somebody whom I honor very much said in a talk that they hoped that this whole field of speech could be developed and corrected by the time that children are eight years of age, but I have proven that this can be corrected and perfected by the time a child is three or four years old and there is no need to go on any further.

'During the Convention, I have been teaching teachers. I was amazed and surprised at how many came to me. I had a room especially for that purpose and I have been amazed at the interest they have had in it. I have seen a growing interest in it. I will probably not appear before a National Convention again but if you will just do this, it will honor me more than anything you could ever do, and that is if you won't turn aside but look into it thoroughly and then if you will try, you can find what is in it. Please, won't you help where you can to see what there is in it and to let the time come when children may be helped when they are still babies and help to prevent so much misery in the world because of speech trouble?

'I want to express my very deep appreciation for what the American Speech and Hearing Association is doing in this movement. I appreciate it deeply and I will appreciate it ten times more if you will just lend an ear to what there is under this work. The big difficulty has been that it happened to one individual but one individual has never stopped working since she was fifteen. She has worked on all sorts of cases in a corner and had no money to do this work for about twenty years. When I began to find out what it does in the way of practical help, then I went into it full-time, and I am sure you will be glad

and the speech profession will be glad if you find out what this help is. I sometimes talk to a group of people who are so stony in its attitude that it appears to me immediately that they are thinking about something else until you are through talking. I thank you very much for the honor you have bestowed upon me.'

Dr. Hawk responded: 'I merely want to thank the Association for honoring me. It is a great surprise to me and I come away with a great deal of humility and can only say "Thank you."'

President Bloomer summarized the reports of the Committee on Association Planning, and the actions taken by the Council on the recommendations of this committee; the Committee on the Establishment of a National Office; the Committee on Organizational Structure; the Committee on Group Insurance; and enumerated the membership of several special committees that had been requested to continue their work.

Moved by Henrikson and seconded by Kopp that Council action reported to the Membership be approved. Passed.

President Bloomer read the list of Committee Appointments that are printed at the end of these minutes.

Honors of the Association. President Bloomer read the following citation:

Resolved: In recognition of his many years of distinguished, scholarly editorship of the publications of the ASHA and his leadership and contributions in the area of research; and in sincere appreciation of his service to the Council of the Association in helping to define and to clarify the form and direction of our professional organization and policies; the Honors of the Association are awarded to Dr. Grant Fairbanks.

Resolutions. The Chairman called upon Carrell, Chairman of the Committee on Honors, to read the resolutions approved by Council.

Amendment to By-Laws. President Bloomer reviewed the action taken on the proposed amendments to the By-Laws and ruled that the vote on the Amendment to Article XIII was out of order because the original amendment had been changed and the By-Laws specified a period of 30 days between Council approval and vote by the Membership. Spriestersbach, who instigated the proposed amendments, recognized the complications involved and recommended that the Membership vote 'No' on the proposed amendments.

President Bloomer read both proposed amendments and called for a vote on each. The amendments were defeated.

President Bloomer expressed his appreciation to the officers, members of the Council, and committee members for their selfless devotion in carrying out their responsibilities. To Dr. Carrell he said, 'It is my privilege to present to you this symbol of your assumption of the executive duties of President of the American Speech and Hearing Association for the year 1956. With this gesture goes the wish and pledge of loyal support throughout your entire administration.'

President-Elect Carrell replied: 'Thank you very much. It becomes my first duty to face an unpleasant task and that is censuring the Chairman of the Committee on Honors, James Carrell, for his failure to read to you the list of Fellows. The Fellows who are named by the Honors Committee are: Frederic Darley, Dorothy Sherman, Jacqueline Keaster, Joseph Sheehan, Mrs. William Watson Davison, Hayes Newby, and Oliver Bloodstein.'

'Then, to proceed to a much more pleasant task, I would like to express to you my thanks for the confidence which you appear to have shown when you elected me as President of the Association. I thought at one time—I still feel that—that it was an unwise decision on your part, but you made the decision and you must abide by it.'

'I, on my part, will do what I can to carry forward the affairs of this Association in an orderly and professional way and in a way which will continue to show the growth which has characterized this Association very, very significantly in recent years. It seems to me that we are already clearly entered into an era where we are achieving full professional status but as you all know, there is still a lot to be done, and we know we will do it. We will see you again in Chicago next year.'

Adjourned 3:20 p.m.

Respectfully submitted,
GEORGE A. KOPP
Secretary-Treasurer

Report of the Committee on Publications

The chief activity of the Committee on Publications during the past year has properly been the publication of the *Journal*, whose affairs are reported by the Editor and by the Association Editor. Also to be reported at this session of the Council is the revision upward of our contract with the printers. Since at the present writing this matter of revision of the contract is still pending, and since this contract is the major financial obligation of our Committee, other prospective activities of the Committee must wait upon the decision. The following have been suggested as publication activities of the Association:

A. The creation of a special journal for the publication of research in our field, leaving the present journal for more general literature.

B. The creation of an annual publication to carry stenographic reports of the professional meetings of our association, to be called the 'Proceedings'.

C. The subsidizing of a project by Sigma Alpha Eta of a bulletin to assist in the recruiting of students at the college level to begin training in the field of speech and hearing therapy.

D. The subsidizing of the publication of an extensive manuscript, already prepared, on the testing of hearing of small children.

E. The production of an authoritative motion picture on the subject of stuttering to be issued to parent groups, education classes, stutterers' clubs, etc.

It should be understood that the proponents of each of these projects suggest ways and means to amortize the capital investments of the Association in these publications.

Extract from the Report of the Treasurer

Balance Sheet

December 31, 1954

Assets		
Current assets:		
Cash		$15,523.78
U. S. Government securities, at cost		15,000.00
Accounts receivable		1,345.25
Total current assets		31,869.03
Equipment, at cost less depreciation:		
Office equipment	$ 921.06	
Less allowance for depreciation	456.48	
		464.58
		$32,333.61
Liabilities		
Current liabilities:		
Accounts payable		$ 5,081.91
Advance payment of dues and subscriptions		2,485.00
Accumulated earnings:		
General Association	$18,434.58	
Journal of Speech and Hearing Disorders and other publications	6,332.12	24,766.70
		$32,333.61

Statement of Income
Year ended December 31, 1954

	Total	*General Association*	*Journal of Speech and Hearing Disorders and other Publications*
Income:			
Association dues	$10,634.75	$10,634.75	$ —
Convention income	3,886.50	3,886.50	—
Member subscriptions	10,449.25	—	10,449.25
Certification fee income	712.50	712.50	—
Library subscriptions	2,816.40	—	2,816.40
Non-member subscriptions	963.50	—	963.50
Single copy sales	1,440.85	—	1,440.85
Bound volume sales	413.50	—	413.50
Other publications sales	1,324.16	—	1,324.16
Interest on government bonds	207.00	138.00	69.00
	32,848.41	15,371.75	17,476.66
Expenses:			
President's expense	168.87	168.87	—
Program committee	274.53	274.53	—
Committee on clinical certification	2,093.65	2,093.65	—
Committee on clinical standards in speech	67.99	67.99	—
Committee on planning	391.90	391.90	—
Convention expense	4,026.54	4,026.54	—
Secretarial assistance	1,025.84	1,025.84	—
Postage	1,881.39	648.13	1,233.26
Stationery and supplies	1,493.44	1,053.69	439.75
Telephone and telegraph	157.60	157.60	—
Accounting service	250.00	125.00	125.00
Travel	214.35	214.35	—
Printing expense	22,813.47	—	22,813.47
Editorial	249.69	—	249.69
Editorial assistance	1,402.21	—	1,402.21
Bad debts	25.00	25.00	—
Depreciation	84.88	84.88	—
Miscellaneous	1,176.29	1,036.71	139.58
	37,797.64	11,394.68	26,402.96
Net income (loss) for the year	$(4,949.23)	$ 3,977.07	$(8,926.30)
Statement of Accumulated Earnings			
Balance at December 31, 1953	$29,715.93	$14,457.51	$15,258.42
Net income (loss) for the year	(4,949.23)	3,977.07	(8,926.30)
Balance at December 31, 1954	$24,766.70	$18,434.58	$ 6,332.12

REPORT OF THE EDITOR

1. *Editorial Office.* In December of 1954 the records, special materials, and Exchange Journals of the office of the *Journal of Speech and Hearing Disorders* were transferred from the University of Illinois to the University of Michigan. The Department of Speech at the University of Michigan has provided an office for the Editor of the *Journal* in 3223 Angell Hall. The Editor of the *Journal*, the secretary to the Editor of the *Journal* and the Assistant to the Editor of the *Journal* are located in this office.

2. *Editorial Staff.* A new plan within the *Journal* staff organization has been initiated, involving Assistant Editors. These Assistant Editors are from the Faculty at the University of Michigan; they have assumed responsibility for the initial review and recommendation

concerning all manuscripts which are received. This provides a very valuable additional evaluation of manuscripts, and it relieves the Editor of the *Journal* of the responsibility for making a preliminary analysis of each manuscript which is received.

3. *Monograph Supplement.* No Monograph Supplements have been published during the year. Many inquiries about the procedures involved in the publication of such Supplements have been received during the year. Each case seems to present its own special problems regarding the financing of the publication.

4. *Directory Supplement.* The Committee on Publications recommended that the various official statements of the Association be included annually in the *Directory Supplement.* Thus, the *Directory Supplement* will become a sort of handbook for the Association, and will contain all official documents, except the Report of the Convention. This Report normally appears in the March issue of the *Journal*, and we probably should continue to publish it at that time.

5. *The Journal of Speech and Hearing Disorders—Analysis of Pages.*

Research and Theoretical Material	*March*	*June*	*Sept.*	*Dec.*	*Directory Supplement*	*1955* Total*	*1954* Total*
Articles	65	65	69			199	253
Abstracts	0	9	9			18	16
	65	74	78			217	269
Practical and Business Material							
Articles	11	0	0			11	47
Book Reviews	4	7	3			14	17
News	3	8	6			17	14
ASHA Business	42	5	17			64	39
Front Matter	2	2	2			6	6
	62	22	28			112	123
Total	127	96	106			329	392

*Exclusive of December issue.

6. *The Journal of Speech and Hearing Disorders—Analysis by Manuscripts.*

	Manuscripts	*Per Cent*
Published: March, June, and September, 1955	27	27.8
In process: As of October 17, 1955	44	45.4
Rejected: January 1-October 17, 1955	26	26.8
	97	100.0

EXTRACT FROM THE REPORT OF THE COMMITTEE ON MEMBERSHIP

Members—2859 *Honors and Certification* (a)	*No. of Members Holding Combination*
Advanced Hearing	42
Basic Hearing	55
Advanced Speech	214
Advanced Speech, Basic Hearing	1
Basic Speech	707
Basic Speech, Advanced Hearing	3
Basic Speech, Basic Hearing	11
Honorary Life Member	3
Honorary Life Member, Advanced Speech	1
Fellow	17
Fellow, Advanced Hearing	8
Fellow, Basic Hearing	1
Fellow, Advanced Speech	76
Fellow, Advanced Speech, Advanced Hearing	1
Fellow, Basic Speech	1
Fellow, Advanced Speech, Basic Hearing	1
Fellow, Honorary Life Member	7
Fellow, Honorary Life Member, Advanced Speech	1

Honors and Certification (b)	*No. of Members Holding Each Type*
Fellow	113
Honorary Life Member	12
Advanced Speech	295
Basic Speech	722
Advanced Hearing	54
Basic Hearing	69
Degrees Held (highest degree held indicated)	*No. of Members*
No degree, or no record of degree	58
Bachelor's Degree	862
Master's Degree	1,498
Ph.D.	358
Sc.D.	7
M.D.	34
D.Ed.	20
D.D.D.	4
D.Litt. and Misc. Doctorates	4
Foreign Diplomas	14
*Types of Employment**	*No. of Members*
Colleges and Universities	574
College or University Hospitals	36
Hospitals—non-educational	129
Public Schools	973
Private Practice	139
Special Institutions and Clinics	400
Graduate Students	55
State Departments of Health	34
Miscellaneous (retired, none stated)	456
Federal Government	63
(Number of all types affiliated with clinics)	(512)
*Types of Employment and Honors Held***	
College or Universities	*No. of Members*
No Honors	214
Advanced Hearing	19
Basic Hearing	13
Advanced Speech	109
Advanced Speech, Basic Hearing	1
Basic Speech	150
Fellow	5
Fellow, Advanced Hearing	5
Fellow, Advanced Speech	57
Fellow, Honorary Life Member	1
College or University Hospital	
No Honors	17
Advanced Hearing	5
Basic Hearing	3
Advanced Speech	2
Basic Speech	6
Fellow	1
Fellow, Advanced Hearing	1
Fellow, Advanced Speech	1
Hospitals—non-educational	
No Honors	82
Advanced Hearing	4

*The 512 persons affiliated with clinics are included in the figures for all types. All, or most of 'Special Institutions and Clinics' are also clinical employments.

**'No Honors' indicates persons who have no certification, fellowship, or honorary life membership.

Basic Hearing	3
Advanced Speech	2
Basic Speech	28
Basic Speech, Advanced Hearing	1
Basic Speech, Basic Hearing	2
Fellow	2
Fellow, Advanced Hearing	1
Fellow, Advanced Speech	2
Fellow, Advanced Speech, Advanced Hearing	1
Public Schools	
No Honors	643
Advanced Hearing	3
Advanced Speech	41
Basic Hearing	13
Basic Speech	264
Basic Speech, Basic Hearing	2
Honorary Life Member	1
Fellow, Advanced Speech	5
Fellow, Advanced Speech, Basic Hearing	1
Private Practices	
No Honors	64
Advanced Hearing	1
Basic Hearing	3
Advanced Speech	11
Basic Speech	50
Basic Speech, Basic Hearing	2
Honorary Life Member	1
Fellow	3
Fellow, Basic Hearing	1
Fellow, Advanced Speech	3
Special Institutions and Clinics	
No Honors	240
Advanced Hearing	6
Advanced Speech	25
Basic Hearing	14
Basic Speech	101
Basic Speech, Advanced Hearing	1
Basic Speech, Basic Hearing	4
Fellow	2
Fellow, Advanced Hearing	1
Fellow, Advanced Speech	6
Graduate Students	
No Honors	44
Advanced Hearing	2
Advanced Speech	3
Basic Speech	10
Fellow	1
Miscellaneous (Retired. No Employment Stated)	
No Honors	339
Advanced Hearing	2
Basic Hearing	3
Advanced Speech	16
Basic Speech	83
Honorary Life Member	1
Honorary Life Member, Advanced Speech	1
Fellow	2
Fellow, Advanced Speech	1
Fellow, Basic Speech	1

Fellow, Honorary Life Member	6
Fellow, Honorary Life Member, Advanced Speech	1
Federal Government	
No Honors	48
Basic Hearing	2
Advanced Speech	3
Basic Speech	6
Basic Speech, Advanced Hearing	1
Basic Speech, Basic Hearing	1
Fellow	1
Fellow, Advanced Speech	1

COMMITTEE APPOINTMENTS

Standing Committees

(Italics indicate ex-officio members)

Committees (Officers; President-Elect, Chairman)

1. *James A. Carrell*
2. *Stanley Ainsworth*
3. *George A. Kopp*
4. *Robert West*
5. *Raymond Carhart*, Chairman

Nominations (Four appointive members; most recent ex-president, Chairman)

1. Claude Kantner
2. Sue Earnest
3. Miriam Pauls
4. Darrel J. Mase
5. *Harlan Bloomer*, Chairman

Budget (President; Editor of the Association; Secretary-Treasurer, Chairman)

1. *James A. Carrell*
2. *Robert West*
3. *George A. Kopp*, Chairman

Liaison (President; Vice-President; Secretary-Treasurer; Editor of the Association; Chairman of Committee on Clinical Certification; Chairman of Committee on Ethical Practice; Executive Vice-President, Chairman)

1. *James A. Carrell*
2. *Jack Matthews*
3. *George A. Kopp*
4. *Robert West*
5. *Ruth Beckey Irwin*
6. *Frederic L. Darley*
7. *Stanley Ainsworth*, Chairman

Convention Program (Vice-President-Elect; appointive members; Vice-President, Chairman)

1. Lydia Newton
2. William R. Tiffany
3. George Shames
4. George Wischner
5. Frederic Darley
6. Henry Moser
7. Merle Lawrence
8. Joseph Wepman
9. Virginia Baird
10. Robert Goldstein
11. John Webster
12. *Virgil Anderson*
13. *Jack Matthews*, Chairman

Membership (One member each from speech disorders, hearing disorders, and basic speech and hearing sciences; Secretary-Treasurer, Chairman)

1. Francis Sonday
2. Arthur House
3. Jean Ervin
4. *George A. Kopp*, Chairman

Honors (Five members who are Fellows; President-Elect, Chairman)

1. Clarence T. Simon
2. S. Richard Silverman
3. Lee Travis
4. Paul Moore
5. Grant Fairbanks
6. *Raymond Carhart*, Chairman

Clinical Standards in Speech (Four members who hold Advanced Clinical Certificate in speech; appointive Chairman)

1. Paul Knight
2. Jack Bangs
3. Frank Robinson
4. Kathleen Pendergast
5. Lester Hale, Chairman (1956-58)

Clinical Standards in Hearing (Four members who hold Advanced Clinical Certificate in hearing; appointive Chairman)

1. Moe Bergman
2. William Hardy
3. LeRoy D. Hedgecock
4. Jacqueline Keaster
5. John Gaeth, Chairman (1955-56)

Clinical Certification (At least eight appointive members, all holding Advanced Clinical Certificate, four in speech, four in hearing; elected Chairman)

1. Charles F. Diehl
2. Alonzo Morley
3. Harriet Haskins
4. Courtney Osborn
5. George L. Shaffer
6. Waring Fitch

7. Victor Garwood
8. Forrest Hull
9. Calvin Pettit
10. Empress Zedler
11. Ruth Beckey Irwin, Chairman (1956-60)

Ethical Practice (Four members, one each from speech, hearing, and basic speech and hearing science; elected Chairman)
1. Herold Lillywhite (1955-56)
2. Zelda Kosh (1955-56)
3. Sylvia Richardson (1956-57)
4. E. Thayer Curry (1956-57)
5. Frederic Darley, Chairman (1956-60)

Terminology (Five members; appointive Chairman)
1. William G. Peacher (1953-56)
2. Elaine Paden (1954-57)
3. Kenneth S. Wood (1955-58)
4. Jack Clark (1956-59)
5. George Herman, Chairman Pro-tem.

Time and Place (Three appointive members; Executive Vice-President, Chairman)
1. Paul Ptacek
2. George Gens
3. Verna Breinholt
4. *Stanley Ainsworth*, Chairman

Publications (Three appointive members, one each from the fields of speech disorders, hearing disorders, and basic speech and hearing sciences; Editor of the JSHD; Editors of any other regular publications; the Business Manager; Editor of the Association, Chairman)
1. S. Richard Silverman (1955-56)
2. James F. Curtis (1955-57)
3. Jon Eisenson (1956-58)
4. *Gordon E. Peterson*, Editor of JSHD
5. *George A. Kopp*, Business Manager
6. *Robert West*, Editor of the Association, Chairman

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2. Clarence Simon
3. Wendell Johnson
4. Margaret Powers, Chairman

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2. Koepp H. Baker
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4. Charles VanRiper
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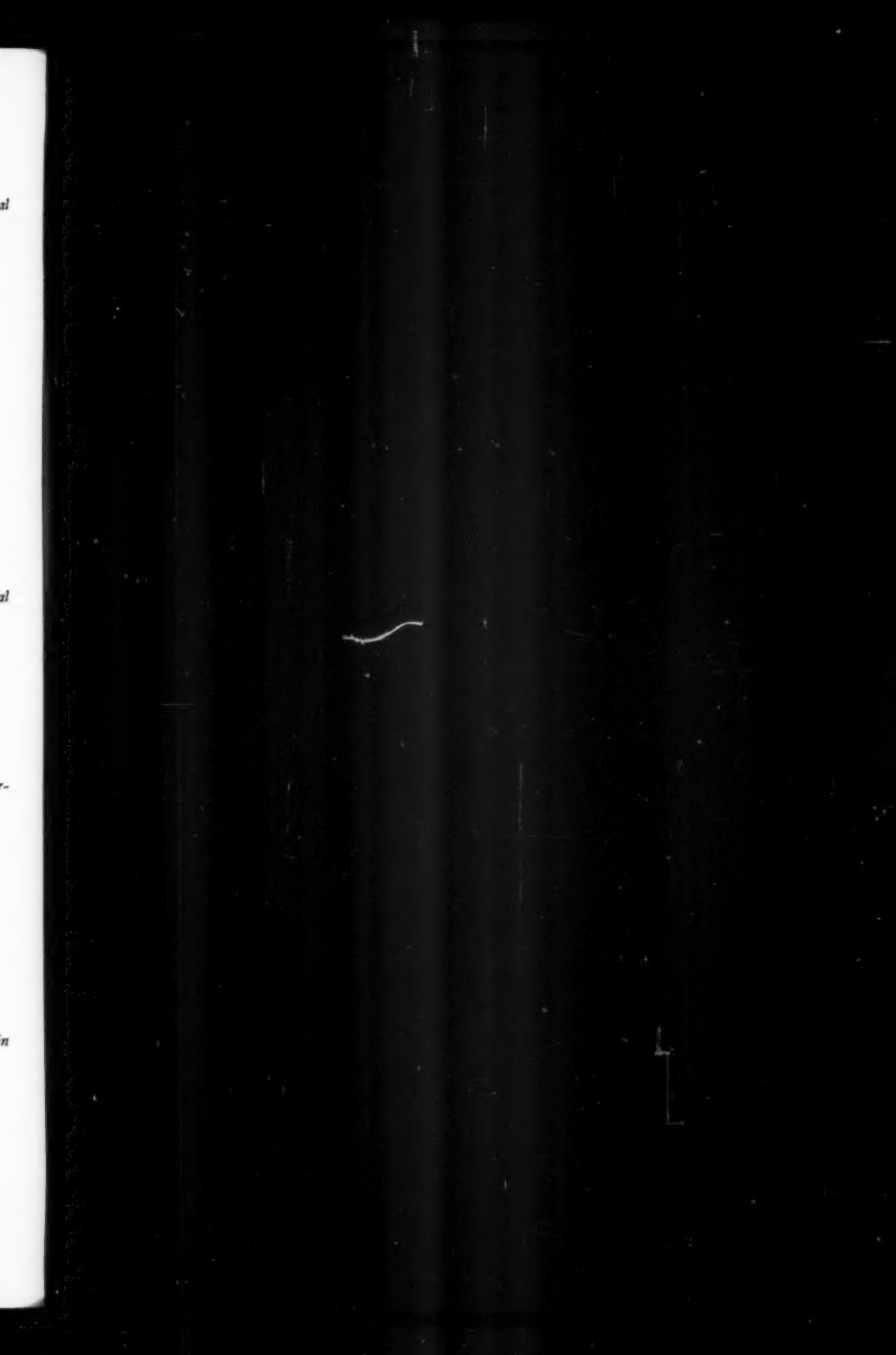
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